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Agricultural Research Institute

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ERRATA.

Vol. 22, No. 8, p. 613. 5th reference from bottom (Pearce & Brown) *delete* Rats and Guineapigs, *for* T.D.B. xix *read* T.D.B. xv.

Vol. 22, No. 11, p. 848. The paper on "An Epidemiological Study in Leprosy" from the *Philippine Jl. Sci.* 1925. May. Vol. 27. No. 1, p. 9 attributed to Callender (G. R.) alone is by Callender (G. R.) & Bitterman (Theodore).

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 1.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

ACTON (Hugh W.) & KNOWLES (R.). **Of** *Entamoeba histolytica* **Carriers.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 440-444. With 1 coloured plate & 1 chart. [3 refs.]

The authors continue their review of the present knowledge of dysentery [see below], in a comment upon the carrier-state of *E. histolytica*. Clinical experience during the last three years had led them to doubt whether the "healthy" carrier is always free from clinical symptoms. Generally he is not sufficiently ill to seek medical advice. The geographical incidence of the carrier-state in India varies between urban and rural areas. The findings are correlated with general methods of sanitation and climatic conditions. The prevalence of the hot dry wind, such as occurs in Mesopotamia and similar countries, is considered to be a factor in the dissemination of the disease. Clinically, two marked types are recognized: the first, a lean cadaverous individual; the second, a fat jovial type. The following is a résumé of the train of symptoms observed: irregularity of the bowel with visceroptosis, colicky vague pain, fever of an irregular type, complications such as bacterial embolism due to haemolytic streptococci, causing "streptococcal showers" in the bloodstream, and consequent arthritis, neuritis, sciatica, urticaria and neuralgia. The laboratory diagnosis is founded on the presence of mucus adhering to the scybala, the reaction of which is alkaline to litmus; the pH optimum medium for cysts is 7·24. Microscopical examination of the stool should be carried out with the addition of normal saline and a solution of iodine 1 part, potassium iodide 2 parts and water 100; this will show up the nuclei and various other structures. A laboratory worker who has not examined 1,000 stools should consider himself a tyro. The presence of Charcot-Leyden crystals is an additional factor in diagnosis. The presence of streptococci and yeasts, demonstrated by cultural examination of the faeces, is suggestive of the existence of *E. histolytica* cysts. The authors advocate that treatment of the carrier should be as vigorous as that of a case of acute amoebic dysentery.

P. H. Manson-Bahr.

(K2182) Wt P17/148 1,750 1/25 H & Sp Gp 52

PONTANO (Tommaso). **L'amebiasi intestinale in Italia.**—*Policlinico.* Sez. Med. 1924. Aug. 1. Vol. 31. No. 8. pp. 417–449.

In 1918 the author pointed out the importance of examining the freshly passed faeces of all diarrhoeic patients, in order to detect the presence of *Entamoeba histolytica* or its cysts, and noted their occurrence in cases which did not show typical symptoms of dysentery. In the present paper, based on a study of 150 cases, it is shown that the classic type of dysentery is rare in Italy, but that amoebiasis may be found in many patients with intestinal disturbance.

The article is divided into six sections. In the first are described the various clinical syndromes in which the entamoeba has been found; in the second, the clinical characters common to patients with intestinal amoebiasis; in the last four, the diagnosis, pathogenesis, prognosis and treatment.

The commonest form of disturbance is intermittent diarrhoea, chronicity and tendency to relapse being the main features, with abdominal pain at the time of the exacerbations, and motions frequently pultaceous. This form occurred in one-third of the cases. In 26·6 per cent. there was alternating constipation and diarrhoea, with abdominal pain during the former. A third group suffered from chronic stasis with pain, possibly due to ulceration; seven of the 150 were of this type. A fourth group, of 13 cases, showed symptoms of relapsing dysentery at long intervals during which the patient enjoys good health. Others, again, referred the symptoms to some particular viscus; for example, those with an "appendicular syndrome" were not infrequently subjected to a needless operation, others simulated hepatic colic, yet others symptoms of rectal stenosis with blood-stained motions, leading to an erroneous diagnosis of malignant growth.

The second section, dealing with the common clinical characters, mentions particularly the tendency to relapses or exacerbations, the chronicity, pain and the presence of mucus in the stools. The question of diagnosis, discussed at considerable length, may be summed up as consisting of faecal examinations and a knowledge of the appearance of the entamoeba and its cysts. Under pathogenesis is given an account of the physiology of the large intestine, a description of the anatomical changes set up by the presence of the entamoeba, and a suggested explanation of the symptoms. Prognosis, in the absence of complications, depends largely upon the length of time the disease has existed. In recent cases cure can nearly always be attained; in the chronic, as a rule, amelioration only.

Lastly, as regards treatment. The use of emetine hydrochloride and of the double iodide of emetine and bismuth is discussed, the former by injection for the more acute cases, the latter by mouth for the chronic. The double iodide is given in pill form each evening 3 hours after a meal for 12–15 days, each pill containing 6 cgm. of emetine. The important points in treatment with this drug are large doses and intermittent repetition of the course until all intestinal disturbances have disappeared and repeated examinations of the faeces after a saline purge fail to reveal any entamoebae. Treatment by nitrate of silver (1 : 4,000) locally and by neosalvarsan, intravenously and by rectal injection, are also briefly mentioned.

H. Harold Scott.

DE VECCHI (Bindo). **Sull' anatomia patologica dell' entero-colite amebica.**—*Sperimentale.* 1924. Aug. 14. Vol. 78. No. 4–5. pp. 407–455. With 3 plates. [50 refs.]

In this paper is described with a wealth of detail the pathological anatomy of intestinal amoebiasis based on three autopsies. In one only was death the result of amoebic infection, namely, by hepatic abscess; the causes of death in the others were, respectively, senile dementia and apoplexy, and cerebral haemorrhage.

For detection of amoebae in the tissues the author fixes in corrosive sublimate and stains, first, with haematoxylin and then in Ziehl's fuchsin diluted 1 in 5. He mentions the points of distinction between the amoeba and various phagocytes and wandering tissue cells, an important matter, since some of the drawings are not very convincing.

As regards the histological characters of the lesions, particular stress is laid upon three points: (1) Imbibition of fluid in the submucosa with hyaline necrosis of the connective tissue in which amoebae are abundant; (2) Absence of polymorphonuclear leucocytes, not only in the lesions of the mucosa, but in the deeper submucous layers; (3) Presence of granulation tissue and a lymphocytic type of inflammatory reaction in the deeper strata. In two of the cases amoebae were seen in the subserous tissues of the appendix, extending to the mesentery, but not to the mucous surface. The changes in this structure are attributed to a previous acute process which brings about an atrophic and fibrous condition, while the amoebae persist in the deeper tissues.

The author believes that intestinal amoebiasis in Italy assumes in many cases a chronic course with prolonged latent periods, and that, if microscopical examination of the intestinal tissues was systematically made in cases presenting the signs of chronic ulceration, amoebae would be more frequently discovered.

H. Harold Scott.

CALLANAN (J. C. J.). **An Epidemic of Amoebic Dysentery in the Igoji and Imenti Divisions of Meru District.**—*Kenya Med. Jl.* 1924. July. Vol. 1. No. 4. pp. 117–123.

This paper fully illustrates the difficulty of investigating the nature of an epidemic of dysentery in native villages. The sick absconded into the bush and were discovered in hiding after a prolonged search. Only two cases had their faeces examined microscopically and in both the amoebae were readily discovered. The horrible insanitary conditions prevailing rendered direct microscopical examinations impossible as a routine measure. In many instances the ground was literally strewn with blood and mucus and swarming with flies. "The stools seen were in all cases typical of amoebic dysentery."

The excellent results observed from treatment by emetine and the speedy amelioration of the dysenteric symptoms after exhibition of the drug may be regarded as diagnostic of the cause of dysentery in this epidemic.

[The high mortality rate, as evidenced by the rough statistics obtained from native sources, the rapid spread of the epidemic and the acute fulminating symptoms, would appear to be more suggestive of an outbreak of bacillary dysentery.]

P. H. M-B.

SMITS (J. C. J. C.). **Appendix and Gall-Bladder in the Surgery of Amoebic Colitis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 521–523.

GILMAN holds that in America frequent relapses of amoebic colitis must be ascribed to the appendix and gall-bladder and advocates the extirpation of both ! ! According to Smits appendectomy in amoebiasis is not a " *bona fide* operation." The faeces of patients in the tropics who complain of symptoms referable to the appendix should be carefully and repeatedly examined by microscope. Operation should never be considered until this is done. In Batavia abscesses and infiltration in the neighbourhood of the caecum are frequently found, but whenever the appendix has been pathologically examined, it has been found unaltered. Other observers have never found the entamoebae in the gall-bladder.

P. H. M-B.

ALLEN (G. V.). **The Diagnosis of Amoebiasis.**—*Kenya Med. Jl.* 1924. Sept. Vol. 1. No. 6. pp. 172–181.

This is a summary of the present knowledge of *E. histolytica* and amoebiasis in general. One original observation is recorded, viz., the discovery at autopsy of amoebic ulceration of the lower part of the ileum. It is stated that " mucous colitis " is undoubtedly due to *E. histolytica.*

P. H. M-B.

HEYMANN (P.). **De l'examen du foie pour pneumo-péritoine dans les cas d'abcès.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 753–768.

Ten cases are recorded as illustrating the value of pneumoperitoneum in locating an abscess of the liver. In eight of them no assistance was rendered to the operator by a radiograph of the hepatic area taken by the customary method, but, after inflation of the peritoneum with air, no doubt could any longer be entertained as to the exact position of the abscess. By the direct radiographic method the view of the diaphragmatic dome is obtained through a depth of lung tissue, while the lower border of the liver is no longer detectable, and the left lobe is quite inaccessible. By the pneumoperitoneal method the organ is surrounded by a gaseous zone which renders its outline and shape visible. The shadow of the liver may be actually seen crossing the spleen. These may be termed the more remote signs, but occasionally the actual outline of the abscess may be discernible. The classical signs of elevation and contortion of the hepato-diaphragmatic dome, limitation of the movements of the diaphragm and obscurity of the sinus, are generally present when the abscess is situated near the superior surface of the liver, but are not usually evident when it is situated on the anterior or inferior surface. In these latter cases, as in four instances quoted, the pneumoperitoneal radiograph showed a shadow at the seat of the abscess. Sometimes the location is effected only when the patient is placed in certain positions. The size of the abscess can be gauged with fair accuracy, while the presence of adhesions may be ascertained.

Another advantage of pneumoperitoneum is the good pictures which may be obtained with a comparatively feeble apparatus. In one obscure case the left lobe of the liver was visible but on exploration nothing was found, the abscess in the meantime having ruptured into the duodenum.

The fear of rupturing adhesions should not be a contraindication to this method; contraindication should rather be based upon the general state of the patient, and the presence of abdominal pain. In spite of the defects in his apparatus (for puncture is made through the lumbar region and the air introduced without any precise gauge), the author has only had to register two incidents. In one case the air was not absorbed for four days and occasional vertigo and a feeble, rapid pulse resulted with cardiac arhythmia. In the other case apparently the gut was punctured and a little faecal material escaped, but no permanent injury was caused. A radiograph on customary lines should always be taken before the pneumoperitoneal method is considered; nor should it ever replace exploratory puncture, but should be considered as an adjuvant to it and to the customary blood examination.

P. H. M-B.

LEAR (Maxwell) & MERRILL (Earl S.). **Amoebic Liver Abscess with a Report of Two Cases occurring in Connecticut.** —*Ann. Surgery.* 1924. May. Vol. 79. No. 5. pp. 730–739. With 4 text figs. [5 refs.]

The occurrence of amoebic abscess of the liver in two patients, in conjunction with a small local outbreak of amoebic dysentery in Connecticut, is the theme of this paper; the outbreak has already been reported upon.* One case occurred in a male, the second in a female; in the former there was no leucocytosis, in the latter but a moderate rise. X-ray examination demonstrated elevation and fixation of the right dome of the diaphragm and enlargement of the liver this is clearly shown in the excellent radiogram which illustrates the paper.

In both cases a definite solitary abscess was found, open operation by the subcostal route was performed and the pus aspirated from the cavity; it is claimed that this procedure is safer than blind hepatic puncture. The patients both received ample injections of emetine. In the authors' opinion treatment by aspiration and systemic emetine medication gives better results than open incision and drainage, in which failure may result from secondary pyogenic infection. Aspiration was not repeated in either case and in neither has there been evidence of recurrence.

P. H. M-B.

FRY (A. Sargood). **The Spontaneous Absorption of Amoebic Abscess of the Liver under Emetine Therapy.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 488–492. With 5 figs. & 2 charts in text. [18 refs.]

Surgeons should make the use of emetine an essential part of pre-operative preparation, if not the sole treatment of liver abscess. Several cases have been reported of amoebic abscess being cured by emetine therapy alone (see this *Bulletin*, Vol. 18, p. 38, HODSON). Two cases are here reported in which large abscesses were certainly present, so large that exploratory puncture would have been an unnecessary refinement. The clinical recoveries are to be attributed solely to the effect of emetine. Of the two cases the second was the more acute, and the continuation of the pyrexia would certainly have led to further methods of treatment had not the general condition of the patient improved.

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* BLAKE (F. G.) & HISCOCK (I. V.). Amebic Dysentery in Connecticut. *Proc. Conn. State Med. Soc.* New Haven. 1923. Vol. 131. pp. 125–139.

The first case presented a marked bulging over the hepatic region, while X-ray examination revealed immobility of the right dome of the diaphragm, a projection rising as high as the nipple. After 12 grains of emetine, in doses of one grain daily, a rapid diminution in the size of the liver and a corresponding decrease in the leucocytes took place. The patient gained 2½ stones in weight.

The second case had a similar swelling (as shown in photograph). The liver dullness extended 11½ inches in the right lateral line and X-rays confirmed the compression of the right lung. There was no leucocytosis. Symptoms subsided after 12 grains of emetine and a remarkable diminution in the volume ensued, but the general improvement was not so marked as in the first case. The author considers that a clinical cure was obtained in both patients with complete absorption of the abscesses, the assimilation of sterile pus being in no way detrimental to the patient. It would appear that aspiration could be dispensed with in many such cases of amoebic abscess.

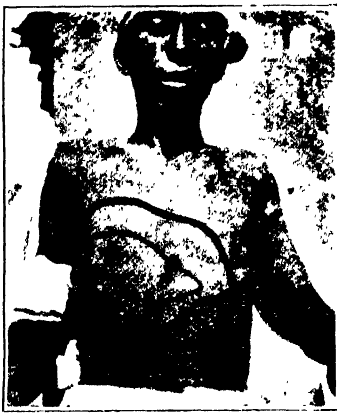

Fig 1.- Captain Fry's Case 2 (Gurkha Rifleman G S R) diagnosed as amoebic abscess of the right lobe of the liver. Photograph shows patient on August 30th, 1923, at commencement of treatment. The deep percussion dullness (indicated by heavy line) reached the upper border of the second rib in front , the superficial dullness (indicated by light line) reached the fourth rib.

(Note . Patient leaning over to right side)

[Reproduced from the *Indian Medical Gazette.*]

P. H. M-B.

Petzetakis. **Traitement systématique de l'amibiase par les injections intraveineuses d'émétine.**—*Presse Méd.* 1924. Aug. 27. Vol. 32. No. 69. pp. 705 710. With 7 figs. [14 refs.]

The author believes that the term "amoebic dysentery" denotes not merely a local intestinal, but a generalized infection. It is preceded by the presence of the amoeba in the bloodstream, which alone can account for the occasional presence of these organisms in the liver, brain, gall bladder, lung, kidney and other viscera. He believes that the life history of the *Entamoeba histolytica* in the human body is not sufficiently understood. The method of intravenous injection of emetine, here advocated, is considered to be much more efficacious and less toxic than the hypodermic or intramuscular methods usually employed, and relapses, as a rule, do not occur. Generally the arterial pressure falls after an injection, not with doses of 0·02–0·03 gramme, but noticeably after 0·04 gramme. In the majority of cases the pulse-rate becomes retarded, sometimes, if the myocardium be unduly irritable, accelerated. As regards the rhythm of the pulse, extra systoles are frequently noted during the injection, especially in young adults.

The injections are made at the bend of the elbow and are seldom accompanied by any disagreeable sensations, at the most slight headache and a tendency to vomit. In the young, feeble, or those with low blood pressure, the dose in the ampoule should be diluted with 2–20 cc. of distilled water. In acute amoebic dysentery the doses given range from 0·03 gm. on the first day to 0·06 gm. on the 12th, making a total of 0·35 to 0·45 gm. In graver cases it is usual to commence with 0·05 gm. and gradually to increase up to 0·1 gm., making a maximum total of 0·6 gm. In gangrenous cases it is permissible to raise the dose to 0·15 gm.

Seven initial intravenous injections are necessary. After twenty days to one month, according to the nature of the case, a second course of injections is advised ; 5 or 6 injections of 0·05 gm. are sufficient, given every second day (a total of 0·30 gm.). Lastly, during the first year following upon an attack of dysentery three other courses of emetine (subcutaneous or intramuscular) should be given—a series of 5 or 6 injections of 0·05 gm. each, making in all five series of emetine injections. In the second year 2 or 3 fresh series of emetine injections are advisable, in order to stave off hepatic and gastrointestinal sequelae.

In chronic amoebic dysentery with the passage of cysts surprising results are obtained, and sometimes permanent cure. The effects are striking in broncho-amoebiasis, cystitis, nephritis, hepatitis, appendicitis, and in a form of cholecystitis which the author believes to be due to *E. histolytica*. The author would explain the specific action as affecting primarily the circulation in lowering the tension. According to the author the drug is also a *decongestive* and *analgesic*.

An immediate toxic action of emetine is rare ; a fatal case is reported after a single injection of 0·35 gm. In childhood and infancy emetine must be given with caution ; below the age of 15 years children are singularly intolerant.

The following doses are given :—

Up to one year individual dose should not exceed 0·05–0·06 gramme ; from 2–3 years, 0·08–0·10 gramme ; from 3–5 years, 0·12–0·15 gramme ; from 5–10 years, 0·20–0·25 gramme.

Investigations upon the intravenous injection of chloride of calcium, $CaCl_2$, have led the author to regard this drug as having a beneficial effect upon dysentery, especially in cases where emetine is contraindicated, and in association with emetine its therapeutic effects are most striking. Symptoms of intolerance to emetine do not supervene. The dose is injected in a 10 per cent. solution, 0·5 to 1 gramme at a time, in the same solution as the emetine, the combination being known as emetine-calcium chloride. The elimination of the toxic effects of emetine is possibly due to the diuretic effect of calcium chloride. The latter method is considered the treatment of choice.

P. H. M-B.

FRENCH (G. R. W.) & SELLARDS (A. W.). **The Effects of *Castela nicholsoni* in the Treatment of Chronic Amoebic Dysentery.**—*U.S. Nav. Med. Bull.* 1924. Aug. Vol. 21. No. 2. pp. 184–190. [4 refs.]

During 1923 seventeen cases of long standing amoebic dysentery were treated in a naval hospital—all veterans of the Great War who had been infected for periods varying from three to six years. As might be expected, the treatment of these cases proved to be difficult; it consisted in the injection of emetine; in no instance had emetine bismuth iodide been exhibited.

Attention is directed principally to *Castela nicholsoni*, of which it is necessary to use potent extracts and to administer practically the maximum tolerated dose. The active principle of Castela has not been definitely determined; it is probably a glucoside. The twigs and finer branches of the plant are ground to fine powder, one kilo of which is extracted by boiling for several hours with pure methyl alcohol. The alcohol extracts the greater portion of the bitter principle. When evaporated at a low temperature an abundant tarry residue remains, which should be extracted with 100 cc. of water. In dosage of 0·3 cc. this extract is lethal to guineapigs. Kittens receiving fatal doses by the mouth develop acute diarrhoea 3 cc. was employed as a dose for an adult, and given once daily for two weeks; diluted with a glass of water at the evening meal it is stimulating to the appetite. There was extreme variation in the response in individual cases, symptomatic relief being obtained in the majority. In eleven the stools became temporarily free from amoebae, in five the infection persisted, and in six the effects of the drug appeared magical.

Difficulties were experienced in the administration of emetine bismuth iodide even in salol-coated pills. The response was poor and the results unsatisfactory. Many patients refused the drug in capsule form on account of the attendant nausea and vomiting. Emetine hydrochloride, 1 grain in 200–300 cc. of saline, proved very irritating. Bismuth subnitrate in large doses is a valuable palliative. In contrast to emetine and its derivatives, preparations of Castela can be administered easily and pleasantly by mouth, and when properly used are more effective than emetine.

P. H. M-B

KOP (W. A.). **Yatren in the Treatment of Amoebiasis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore. 1923.* pp. 515–520. [4 refs.]

The treatment of amoebic dysentery, especially of the chronic cases, is still unsatisfactory. According to the author emetine-bismuth-iodide is nearly always a failure. He favours the use of Yatren, supplied by the Behringwerke, Marburg, Germany, which is iodine-oxychinolin-sulphonic-acid mixed with 20 per cent. sod.-bicarb.; when taken in solution by the mouth it becomes iodine-oxychinolin-sulphate of soda with the liberation of CO_2. Yatren is easily dissolved in water up to a 6 per cent. solution and is practically non-poisonous. It can be given orally, subcutaneously, or intravenously. It is a cell-stimulant and strong disinfectant. KUENEN has reported well of it, and it is widely used in the Dutch East Indies. MÜHLENS and MENCK give it in an enema of 2–10 per cent. By the mouth, as the author and others exhibit it, the drug is given to an adult in 1 gm. doses in powder form three times a day continuously for ten days, the course to be repeated after an interval of one week. The diet should consist of light and varied food, biscuits, soft-boiled eggs, milk, soup, and mashed potatoes. Patients need not be confined to bed. Acute cases are first treated with injections of emetine till the symptoms abate. Yatren itself produces diarrhoea; it is excreted in the urine, which gives a positive oxychinolin test (green colour with ferric chloride). Iodism is never caused, although Yatren contains 36 per cent. of iodine. The good results are probably brought about by its cell-stimulating properties. An illustrative case is cited of a boy of 10 years with an amoebic dysentery refractory to emetine in all forms. After 1 gm. of Yatren in two days all protozoa vanished from the stools and have not been noted since. The author is now experimenting with one course of ten days' treatment. The cost of the double course is £5.

P. H. M-B.

TRAVAGLINO (P. H. M.) & SOEDJONO (Raden Mas). **De therapie der amoebendysenterie.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 551–580.

This is a circumstantial account of the writers' experience in about 350 cases among the population of a lunatic asylum in Java, offering very favourable conditions for protracted observation.

Yatren ranks highest among the drugs they administered; emetine injections figure next in efficacy. Emetine bismuthous iodide was not so effective [but the dosage administered was only about one-seventh of the usual]. Tannin injections are too painful. Cane sugar enemas, ipecac powder in salol-coated pills, bismuthous preparations per os, or simply diet and rest, were not successful, nor were quinine enemas. Of the native drugs tried one, called "setjang," appeared to give satisfactory results.

[It does not appear from the description whether *E. coli* infections were eliminated from the material with sufficient certainty; the authors distinguish between *histolytica, minuta* and *tetragena* forms and cysts, which classification is not quite clear; they apparently do not consider the presence of cysts merely as a proof of the still existing infection, but take such cases as a separate class. These and similar shortcomings diminish the value of the authors' conclusions. Moreover, the separate series of cures, except that of cases treated with emetine injections, are rather small.]

W. J. Bais.

SELLARDS (Andrew Watson) & LEIVA (Lamberto). **Experimental Therapy of Amoebic Dysentery.**—*Jl. Pharm. & Experim. Therap.* Baltimore. 1924. Jan. Vol. 22. No. 6. pp. 467–481. [12 refs.]

Continuing their studies, the authors have tested a miscellaneous group of substances in liquid medium upon limax amoebae. The basis was composed of peptone 1 gm., lactose 1 gm., water to 1,000 cc., and in this the organisms grew readily at 37° C. The results obtained by various investigators with limax amoebae are not comparable, because no attempt has been made to standardize the conditions of experimentation. Utilized in this manner, emetine hydrochloride in a strength of one in a million exerts a strong inhibitive action, and as an example of the elimination of unpromising substances which is possible by this method the feeble action of *Tinospora rumphii* Boerlage is cited, a plant which has a great reputation amongst the natives of the Philippines.

The study of the therapeutic action on experimentally infected kittens is vitiated by the secondary septicaemia which results in these animals as the result of bacterial invasion of the amoebic lesions. Early diagnosis is requisite for successful treatment in cats, as the spontaneous discharge of blood and mucus per rectum does not appear till the bowel is very extensively involved. Forty-eight hours after inoculation of material per rectum amoebae may be demonstrated in faeces obtained by enemata. Six adult cats, weighing 1,800 to 2,400 gms. were given emetine hydrochloride in daily doses of 10 mgm. per kilo for three successive days; the injections were given subcutaneously in two and per rectum in four. Two of the former and one of the latter died as a result. Subsequently the total quantity used in treatment did not exceed 25 mgm. per kilo. The results indicated that the drug was more effective by the rectal route than by the subcutaneous. Adult cats responded readily to treatment; two animals which died 35 and 82 days after inoculation showed no lesions in the colon; in other animals death took place from bacterial septicaemia after the amoebae had disappeared. In kittens early and vigorous treatment demonstrated the efficacy of emetine even when death from bacterial invasion eventually occurred. Prophylactic injection of emetine did not prevent the subsequent infection with entamoebae. A few experiments with quinine (200 mgm. per kilo) per rectum gave surprising results. One animal treated early in the course of the disease recovered promptly. No satisfactory results were obtained with papaverine or extracts of *Castela nicholsoni*.

In man a comparatively small amount of emetine (1 or 2 mgm. per kilo) will usually check the acute symptoms in a few days, but a larger amount (7–10 mgm. per kilo) is required in kittens. Recovery from amoebic dysentery in man and the lower animals results from (*a*) the natural resistance of the host and (*b*) moderate toxic action of emetine on the entamoebae.

P. H. M-B.

REISS (Friedrich). **Ueber Amöbenzystitis.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 8. pp. 334–336. [4 refs.]

Cases of amoebic infection of the bladder are rare. In the two instances reported in this paper, symptoms consisted of strangury and haematuria. On examination of the urine small forms of the amoeba (*Amoeba minutissima*) became apparent. The bladder was irrigated with a 10 per cent. Yatren solution containing 5 per cent. novocaine; in spite of the analgesic considerable pain was caused by the injections, which were performed every second day till fourteen had been given.

The second case had suffered four years previously from amoebic dysentery, and in him cystoscopic examination revealed actual ulceration of the trigone of the bladder, which under Yatren therapy healed in six weeks.

[The author's knowledge of the bionomics of *Entamoeba histolytica* does not appear to be very accurate, for he states that *Amoeba histolytica minutissima* is a form characterized by its small size and by its formation of only three cysts ! !]

P. H. M-B.

CARBONARO (G.). **Amebiasi in Sicilia—sopra un caso di localizzazione amebica nell' apparato urinario.**—*Policlinico.* Sez. Prat. 1924. Oct. 13. Vol. 31. No. 41. pp. 1327–1331. [23 refs.]

The patient, a man of 61 years, in June, 1921, had an attack of haematuria, and in March, 1922, a more severe attack lasting for three days and returning at brief intervals, accompanied later by strangury and dull pain in the left lumbar region. He came under observation in February, 1923. Examination of the urine revealed pus and "numerous bodies, 20–30μ in diameter, round or irregularly oval, some with included bacteria and red corpuscles ; there was no doubt that they were amoebae." No tubercle bacilli were found. X-rays showed that the left kidney was nearly twice its normal size. Treatment by the usual methods was ineffectual. Emetine was injected ; 2cgm. the first day, 6cgm. on the second and third, 8cgm. on the fourth and following days until 1 gm. had been injected in 16 days. From the beginning of this treatment the condition started to improve, but after an interval a second course was administered. The amoebae became very scarce, the renal enlargement diminished and the patient left on May 5th. Improvement was maintained so that he was able again to undertake light work. Faecal examinations at no time revealed any amoebae, nor had there been any intestinal symptoms.

H. Harold Scott.

WORSLEY (A. N.) & BATEMAN (J. E.). **A Case of Urinary Amoebiasis.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 15. Vol. 27. No. 20. pp. 278–279. [3 refs.]

The patient, an Englishman of thirty years of age, suffered from three attacks of strangury with frequency of micturition and vomiting of bile and mucus. The bladder pain was referred to the right testicle and attended by diarrhoea and tenesmus. X-ray examination revealed no renal calculus. *E. histolytica* cysts were found in the faeces. A microscopic examination of the urine revealed a faint cloud of albumin, red blood corpuscles, a moderate number of pus cells, and a considerable number of rounded bodies from 10–30μ in diameter ; most were spherical, a few pear-shaped showing clear pseudopodia. In only one was definite movement detected, and on comparing them with figures of the pre-cystic stage of *E. histolytica*, they were found to agree.

Treatment consisted of emetine bismuth iodide 3 grains by the mouth combined with emetine hydrochloride ½ gr. hypodermically for five days. During treatment the amoebae in the urine became spherical and showed no pseudopodia. The authors think this was a case of urinary amoebiasis with infection of the kidney or of its pelvis.

P. H. M-B.

PETZETAKIS. **Cystites amibiennes. Cystite amibienne à "Entamoeba polymorpha." Y a-t-il une urétrite amibienne ?**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. July 31. 3rd Ser. Year 40. Vol. 48. No. 27. pp. 1227–1230. With 2 figs. [2 refs.]

Amoebae may become localized in the pelvis of the kidney or in the bladder, and may be found in the urine during the course of an acute dysentery. A case is cited of haematuria and frequency of micturition in a young man in whose urine these organisms were found and who was permanently cured after six injections of emetine. The characters of the amoeba found are such as to leave no doubt in the author's mind that he is dealing with a new type of organism, provisionally named *Entamoeba polymorpha*. A case of urethritis, also said to be of amoebic origin and cured by five injections of emetine, is cited.

[The figures of the "entamoeba" which illustrate this article are extremely crude, for neither in the vegetative forms nor in the cysts depicted, stained or unstained, do they bear any resemblance to these familiar protozoa.]

P. H. M-B.

EMILE-WEIL (P.) & LAMY (A.). **Un cas d'abcès amibiasique du poumon guéri par l'émétine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Oct. 23. Year 40. 3rd Ser. Vol. 48. No. 29. pp. 1408–1411. [2 refs.]

The authors record a case of pulmonary embarrassment with pyrexia, which they attributed to an abscess of the lung of amoebic origin.

In 1919 the patient had resided 3 months in Algiers, where he had a serious attack of diarrhoea which subsided spontaneously; there was no hepatic involvement. In May, 1924, he was admitted to hospital suffering from pulmonary trouble, the signs indicating partial consolidation of the right lower lobe. X-ray examination revealed a somewhat dense shadow between the second and fourth intercostal spaces. The abundant sputum contained no amoebae. A remarkable improvement in his physical signs and condition took place the moment emetine therapy was instituted; the muco-purulent sputum ceased within 24 hours, while an X-ray examination revealed only a faint opaqueness at the site of the former lesion. Six injections of emetine (0·04 gramme per day) appear to have been sufficient.

The diagnosis of pulmonary amoebiasis, with a coexistent amoebic dysentery, may be comparatively easy; it may have to be made, as in the present instance, on concurrence of suggestive circumstances.

P. H. M-B.

VILA CORO (A.). **Irido-ciclitis amebiana.**—*Rev. Méd. de Barcelona.* 1924. Aug. Year 1. Vol. 2. No. 8. pp. 130–145.

The author describes in minute detail a condition of irido-cyclitis which, if treated on the usual lines, does not clear up but slowly progresses to total destruction of the eye. The symptoms of cyclitis precede those of iritis. Pain, at first supraorbital, is considerable; photophobia is not usually present. The prognosis depends on the stage at which the patient comes under treatment and on the recognition of the cause. This is said to be the toxins produced by the *Entamoeba coli* [not *E. histolytica*]. All the patients referred to were passing this protozoon or its cysts in their faeces. Treatment by emetine injections—4 cgm. for three consecutive days, then 8 cgm. for another three, and 12 cgm. for three more, 72 cgm. in all—brings about a rapid cure if the patient is seen sufficiently early. The *E. coli* also disappears from the stools. Locally, a solution containing atropine sulphate, adrenalin, dionin and mercuric cyanide is used. The author believes that the *E. coli*, without penetrating the intestinal mucosa, produces toxins which are absorbed by it.

H. Harold Scott.

i. KESSEL (John F.). **Methods of obtaining Amoeba-Free Rats for Experimental Infection with Intestinal Amoebae.**—*Univ. California Public Zool.* 1923. Oct. 31. Vol. 20. No. 18. pp. 401–408. [9 refs.]

ii. ——. **Experimental Infection of Rats and Mice with the Common Intestinal Amoebae of Man.**—*Ibid.* No. 19. pp. 409–430. With 2 plates. [21 refs.]

i. For cleaning rats of existent intestinal microparasites for subsequent experimental infections, as well as for other purposes, the author recommends merely feeding them on bread soaked in a saturated solution of mag.-sulph. Young rats, naturally, are the best for experimental work.

ii. The author infected rats with five species of human amoebae—including *E. histolytica*, *E. coli* and *Councilmania lafleuri*—by feeding them with human faeces containing the respective cysts, and from the faeces of the rats so infected he succeeded in infecting other rats (by feeding). The species thus transferred from the human to the rat host underwent no apparent morphological change. Infections of *E. histolytica* in rats and mice assumed apparently a chronic form, and one of four rats that died had an intestinal ulcer. From the result of these experiments the author concludes that " heavy suspicion is thrown on the rat and mouse as possible carriers of the causative organisms of human amoebiasis." Full details are given.

A. Alcock.

KOFOID (Charles A.), SWEZY (Olive) & KESSEL (John F.). **On the Genus Councilmania, Budding Intestinal Amoebae Parasitic in Man and Rodents.**—*Univ. California Public. Zool.* 1923. Oct. 31. Vol. 20. No. 20. pp. 431–445. With 19 text figs. [11 refs.]

The genus *Councilmania* of Kofoid and Swezy, the natural basis of which is impugned by some good authorities, is here again defined, and two species besides the genotype (*C. lafleuri*) are now included in its compass, these species being *Amoeba muris* Grassi (*Entamoeba muris* Wenyon, *ex parte*) and *E. muris decumanus* Rudovsky. All three species are here defined, figured, and brought into perspective.

A. Alcock.

i. JACONO (Igino). **Le coliti amebiche. (Nosografia e diagnosi.)**—*Riforma Med.* 1924. Oct. 27. Vol. 40. No. 43. pp. 1017 1019. With 3 figs.

ii. PANAYOTATON (Angelika). **Die extraintestinale Amöbenerkrankung in Aegypten. Amöbenerkrankung und Tuberkulose.**—*Wien. Klin. Woch.* 1924. Aug. 14. Vol. 37. No. 33. pp. 801–802.

iii. PETZETAKIS (M.). **A propos des bronchites amibiennes.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 553–554. [5 refs.]

iv. COUVY (L.). **Note sur le traitement de la dysenterie amibienne par le stovarsol.**—*Ibid.* pp. 555–556. [4 refs.]

v. PHEAR (Arthur G.). **The Treatment of Dysentery. II.—Amoebic Dysentery.**—*Lancet.* 1924. Aug. 9. pp. 284–285.

i. A sketchy review of amoebic dysentery from the clinical aspect.

ii. This article on pulmonary amoebiasis differs in no wise from the several papers which have recently been reviewed in this *Bulletin*.

iii. Petzetakis claims priority in the description of "amoebic bronchitis" [a very problematical condition], which is an invasion of the bronchi by amoebae and comparable to a similar condition produced by spirochaetes in broncho-spirochaetosis. Pulmonary amoebiasis is due to actual abscess formation in the lung itself.

iv. Briefly relates recent experiences in the treatment of amoebic dysentery with stovarsol. The dose was 6 cgm. daily. Three cases are cited.

v. This concise and well-written article contains an account of the general principles upon which the modern treatment of amoebiasis is based and deals as well with diagnosis.

P. H. M-B.

BACILLARY DYSENTERY.

CUNNINGHAM (J.). THEODORE (J. H.) & KRISHNAN (K. V.). **Further Observations on Latent Dysentery.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 83–92.

The term "latent dysentery" denotes a state occurring in individuals amongst normal populations who, while capable of normal work, and showing no manifest signs of illness, are nevertheless the subjects of pathological lesions. The amount of latent dysentery in any population forms a definite index of the prevalence of the disease in the community. The paper is based upon the records of three separate investigations. The first was undertaken by BATEMAN in a military community; the other two on prisoners during the Moplah rebellion. In these investigations the whole stool of each individual is examined macroscopically for the presence of mucus or any other abnormality. The percentage of abnormals detected agrees very closely in each series. The percentages recorded are 9·6, 7·9, and 7·7 per cent. In Bengal it was shown that a single examination was not sufficient, but that ten successive examinations were requisite. The proportion of latent dysentery cases may be regarded as constituting a "dysenteric index" much in the same way as the spleen rate in malaria. From a single bacteriological examination dysentery bacilli were isolated in 5 per cent. of one series and in 21·1 per cent. of the other. The excretors of dysentery bacilli may be in apparent good health. Diarrhoea, unless proved to be due to another cause, should be considered as latent bacillary dysentery. A series of 12 macroscopic examinations should suffice to detect all but a negligible quantity. The dysenteric index in the jails in Eastern Bengal was found to be 19·8 per cent. [See also Vol. 21, p. 38.]

P. H. M-B.

UKIL (A. C.). **Is there an Outbreak of Bacillary Dysentery in Calcutta?**—*Calcutta Med. Jl.* 1924. July. Vol. 19. No. 1. pp. 33–36. [4 refs.]

Bacillary dysentery due to Shiga or Flexner bacilli is uncommon in Calcutta; in cases of gastroenteritis, which are frequent in the rainy season, organisms of the Gaertner group are more commonly encountered. During the current year, bacillary dysentery seems to be on the increase, and during the three months May to July, Shiga's bacillus has been isolated 12 times, Flexner's bacillus twice, out of 80 samples of faeces received. Only one case, as far as is known, proved fatal.

P. H. M-B.

LITTLE (E. Marjory) & ROSS (Marjory J.). **Dysenteric Conditions in Children.**—*Med. Jl. Australia.* 1924. July 5. 11th Year. Vol. 2. No. 1. (Supplement.) pp. 472–474. [9 refs.]

The disease can be diagnosed with certainty only by the recovery of the bacillus from the stools. This depends upon three factors: the period of the disease at which the stool is examined, the lapse of time between the collection of the material and its examination, and the selection of the material.

The patients of one group were usually under one year of age, with a history of chronic intestinal disturbance, attacks of diarrhoea alternating with constipation. The stools were usually green, and contained much mucus with occasional streaks of blood. As a rule the mortality rate was high. No known pathogenic organisms were recovered from the faeces.

In a second group the patients were acutely ill, with a history of suddenly developed diarrhoea with colic and tenesmus. No dysentery bacilli were isolated, but Morgan's bacillus No. 1 and members of the Salmonella group.

In the third group the ages of the patients ranged from three months to seven years. The onset of the disease was that of a true dysentery with abdominal pain and sometimes vomiting. *Bacillus dysenteriae* was recovered from 117 cases.

For the collection of material it was found best to wash out the bowel with sterile normal sodium chloride solution. The first and last portions of the fluid returned were sent to the laboratory for examination. A higher percentage of positive findings were obtained when washed mucus was examined than from inoculation with faecal material.

Three types of dysentery bacilli were isolated. Flexner-Y organisms were recovered from 86 cases; Shiga's bacillus from six cases. Late lactose-fermenting organisms were obtained in twenty-five cases, of which twenty were agglutinated by Sonne antiserum, and could therefore be classed with that group. *Bacillus dysenteriae* was isolated in the majority (75 per cent.) of those stools which contained blood. Clinically the patients with bacillary dysentery presented a striking picture.

In treatment a polyvalent serum, made by the Commonwealth Serum Laboratories from strains of Flexner's bacillus, Shiga's bacillus, and a Sonne bacillus isolated in Australia, was employed. 30 cc. was found to be the most satisfactory initial dose, and the intraperitoneal the best method of administration. By this method 30 cc. of serum are added to 150 cc. of a solution of 5 per cent. glucose in normal saline. The fluid is warmed to body temperature and allowed to gravitate through a funnel into the peritoneal cavity. Of eighty patients of this series who received serum eighteen died, that is 22 per cent.; of thirty-one patients who did not receive serum thirteen died, that is 41·9 per cent.

P. H. M-B.

BEARE (F. H.). **Dysenteric Conditions in Children.**—*Med. Jl. Australia.* 1924. July 5. 11th Year. Vol. 2. No. 1. (Supplement.) pp. 474–475.

The official statistics issued in the Commonwealth Year Book indicate that the true importance of dysentery as a cause of death has not been fully recognized ; this applies to adults as well as children. In the Adelaide series no Shiga infection was found, Flexner's bacillus, and in one case that of Sonne, being responsible. There is a close association between flies, horses and the incidence of dysentery ; probably this is explicable by the fact that these insects breed in horse manure. Thus of fifty-one homes from which dysentery patients came, horses were associated in forty-one, or 80 per cent.

P. H. M-B.

SMITH (J.). **Enteritis due to** *B. dysenteriae*, **Sonne.**—*Jl. of Hyg.* 1924. Sept. Vol. 23. No. 1. pp. 94–97. [10 refs.]

In December, 1923, a small outbreak of enteritis occurred in a ward of the City Hospital, Aberdeen, involving four infants of ages ranging from 5 to 15 months.

Fever was accompanied by a corresponding pulse-acceleration with the passage of mucus and, in two cases, of blood in the stools. From the faeces of two out of the four cases non-lactose-fermenting colonies were obtained ; the organisms produced acid out of glucose and mannite, were non-motile, did not liquefy gelatin, nor produce indol. Both strains were pathogenic for rabbits, and when compared with *B. dysenteriae*, Sonne, from the National Collection of type cultures, were found to be very similar and completely absorbed the agglutinins from specially prepared serums. The serum of the patients agglutinated the two strains to a dilution of 1 : 480, but did not react with well-known types of Flexner and Shiga bacilli. When tested against monovalent serums prepared from *B. dysenteriae*, Flexner, V. W, X, Y & Z, it was found that the first mentioned agglutinated all the strains to a titre of 1 : 400, but absorption tests showed that the homologous agglutinins were not removed. Efforts to trace the source of infection were unsuccessful.

P. H. M-B.

POSSELT (Adolf). **Gallenwege- und Lebererkrankungen bei Bazillenruhr.** [Affections of the Bile Passages and Liver in Bacillary Dysentery.]—*Wien. Klin. Woch.* 1924. Sept. 25. Vol. 37. No. 39. pp. 987–993. [10 refs.]

The author considers that, in consequence of the mass-experiment of the war, bacillary dysentery must now be regarded as a possible cause of disease of the liver and bile passages. He thinks the reason why this important factor has been missed is the remoteness in time of the original illness and possibly often the unobtrusiveness of the symptoms, which may have been mild or atypical. Undoubtedly bacillary dysentery belongs to the group of diseases whose full import is often missed ; its sequelae are numerous and could best be observed either in the special dysentery hospitals during an epidemic or in the convalescent camps. Just as in the typhoid-coli group, extra-intestinal infections or primary infections of the liver and bile passages may occur. The dysentery bacillus may persist in the gall bladder [? on what evidence] presumably owing to a bacillary dysentery "bacteriaemia," which probably explains the carrier state in this disease. In all affections of the liver and gall bladder the serum should be tested for dysentery agglutinins as is done in the typhoid group. Protocols are given in this paper of cases of jaundice, cholangitis, cholecystitis (40 cases), cholelithiasis (18 cases), liver abscess (4 cases), all of which are said to be ascribable to infection with Shiga or Flexner bacilli.

P. H. M-B.

SSYSSOJEW (Th. Th.). **Ueber die Veränderungen der Gekröselymphknoten des Dickdarms bei Dysenterie in Kindesalter (mit Berücksichtigung einiger hämatologischer Fragen).** [Changes in the Mesenteric Lymph Glands of the Colon in Dysentery of Children. Some Haematological Questions.]—*Virchows Arch. f. path. Anat. u. Physiol.* 1924. June 6. Vol. 250. No. 1/2. pp. 15–29. [5 refs.]

The mesenteric lymph glands were examined in 12 fatal cases in children ranging from 3–4 years of age. Macroscopically the glands present a characteristic appearance, being 3–15 mm. in length, and bean-like in shape and size. Microscopically they show oedema and confusion of medulla and cortex. A deposition of fibrin also takes place and this can be seen in the blood vessels as well as in the collagenous fibres of the capsule. The most striking feature is distension of the sinuses, which in the necrotic cases are filled with blood. Extravasated red blood corpuscles can be distinguished in the stroma. The histological picture is that of a haemorrhagic fibrinous lymphadenitis.

P. H. M-B.

SSYSSOJEW (Th.). **Der blutbildende Apparat bei der Dysenterie.** [The Blood-forming Apparatus in Dysentery.]—*Virchows Arch. f. path. Anat. u. Physiol.* 1924. June 6. Vol. 250. No. 1/2. pp. 41–53. [3 refs.]

This paper is based upon a study of 15 fatal cases of dysentery in children of 1½–12 years of age, the duration of the illness varying from 7 days up to 6 weeks. The bone marrow, spleen, thymus and mesenteric lymph glands were examined in every case. The bone marrow shows inflammatory changes, the sinusoids being distended and filled with blood. One particular cell is present which the author considers to be characteristic of dysentery: it is apparently a large lymphocyte and is generally observed only in the lymph apparatus. The other striking change is seen in the megakaryocytes, which become extremely numerous about the 15th–18th day of the disease; the cells themselves show considerable intrinsic changes. These degenerative changes coincide, the author thinks, with a diminution in the number of blood platelets in the blood stream, and are due to the action of the dysenteric toxin upon the bone marrow. Macroscopically the spleen is not altered. Microscopic section shows that the Malpighian corpuscles react to the hyperplastic process with an influx of lymphocytes which also invade the pulp tissue. The changes in the thymus correspond to those seen in other intoxications. The remainder of the paper is occupied by theoretical considerations of the result of the changes in the blood-forming organs upon the cells of the circulating blood.

P. H. M-B.

GOTTSCHALK (Charlotte). **Ueber Beobachtungen am Blutbilde bei einer Ruhrendemie.** [The Blood Picture in Dysentery.]—*Muench. Med. Woch.* 1924. Sept. 26. Vol. 71. No. 39. p. 1358. [7 refs.]

Blood examination was undertaken in a series of eighteen cases in an epidemic of bacillary dysentery. In 61·1 per cent. an absence of eosinophile cells was demonstrated. At the termination of the illness the eosinophile cells rose to normal (2–4 per cent.). In other severe cases of intestinal disturbance, due to tuberculosis, carcinoma, sublimate poisoning, etc., a similar aneosinophilia was observed.

P. H. M-B.

LICHTENSTEIN (A.) & VAN STEENIS (P. B.). **Atypische bacillaire dysenterie.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 13. Vol. 68. 2nd Half. No. 11. pp. 1359–1370. [18 refs.].

An account of atypical cases of dysentery, with slight clinical symptoms, observed in Batavia. It is written for the benefit of practitioners in temperate regions, who often do not recognize this disease in its atypical form, though the patient may be a source of infection for his surroundings, notwithstanding the absence of grave symptoms.

A description is given of the bacteriological technique used and the value of the Widal test in bacillary dysentery is discussed. A negative result does not prove anything; a positive only if the agglutination takes place in a dilution higher than $\frac{1}{400}$ with atoxic dysentery bacilli (comprising the types Flexner, Strong, etc.) and $\frac{1}{200}$ with the bacillus of Shiga-Kruse.

The atypical cases are usually caused by the bacilli of the atoxic type, but five cases are recorded where the Shiga-Kruse bacillus (belonging to this type by its cultural characteristics) was found. In two of these cases the strain had lost its toxicity for rabbits; in one this was still perfectly intact, although the patient from which they came was hardly ill. Fifteen atypical cases are described where the atoxic type of bacillus was found. Concerning the differential diagnosis it is stated that in malaria with dysenteric symptoms there is always a concomitance of both causative agents and that "malaria dysenterica" caused by plasmodia alone does not exist.

N. H. Swellengrebel.

GUIMARÃES (Aristides). **Soro-diagnostico na dysenteria bacillar.**—*Brazil Medico.* 1924. July 12. Year 38. Vol. 2. No. 2. pp. 15–19.

The diagnosis of infection by one or other of the bacilli of dysentery is important from two points of view. Firstly, dysenteric symptoms may be caused by other than true dysentery bacilli, such, for example, as *B. paratyphosus* A, *B. tuberculosis*, etc.; secondly, dysentery bacilli may cause an illness simulating, for example, typhoid fever.

From an analysis of 175 cases the author concludes that agglutination is a reliable test, a 24 hours' culture emulsified in normal saline being used. By microscopical methods the results are read after 1–2 hours at 37° C., by macroscopical after 8–24 hours at laboratory temperature. He finds the macroscopical better than the microscopical. The test should be carried out "twice during the acuter stages and once during convalescence." It is usually positive 7 days after the onset. Vaccine treatment, he affirms, does not affect the agglutination titre. At the beginning of the epidemic the number of positive results obtained was as high as 75 per cent., whereas six months afterwards it was only 37 per cent., but the titre of agglutination was much higher in the latter.

H. Harold Scott.

PASCAL (C.). **Vaccination antidysentérique par voie buccale.**—*C. R. Soc. Biol.* 1924. Oct. 24. Vol. 91. No. 29. pp. 874–876.

Two epidemics of bacillary dysentery broke out in an asylum at Châlons-sur-Marne in 1923 and 1924; their exact origin was never discovered.

The first occurred towards the end of 1923. Within 10 weeks 65 persons out of a total of 256 had been attacked. In April, 1924, two new and rapidly fatal cases were discovered, followed by seven others. It was then decided to protect the remaining occupants, in all 399 persons, with the antidysenteric entero-vaccine of Besredka. The greater number of the inmates were cardiac, tuberculous and syphilitic subjects, but all took the vaccine pastilles without any reaction. The vaccine was given in two portions. During the first course of immunization two new cases declared themselves. Three attacks of dysentery amongst the vaccinated subjects were subsequently notified, one of which was severe. The following figures were obtained :—

	Inmates.	Vaccinated.	Cases of dysentery in unvaccinated.	Cases in vaccinated.	Percentage sick.
1923	256	—	65	—	22·72
1924	410	399	—	3	0·75

The author considers these figures very suggestive.

P. H. M-B.

MANSON-BAHR (Philip) with a Section on the Operative Treatment in Collaboration with GREGG (A. L.). **The Pathology and Treatment of Chronic Bacillary Dysentery.**—*Jl. State Med.* 1924. Aug. Vol. 32. No. 8. pp. 356–366. [3 refs.]

In addition to the pathology and treatment this paper deals with the diagnosis of chronic bacillary dysentery. The author draws attention 'to the fact that, though the condition may start as a mild or subacute dysentery, it is, in most cases, chronic, as it were, from the beginning. The best means of obtaining the causative organism at autopsy is by washing the intestine free of faeces, scraping the base of the ulcer with a sterile knife, and plating upon a suitable medium the exudate from beneath the edge of the ulcer. Three lines of treatment are considered : (1) Dietetic.—Reasons are given to show that it is not the restriction of food to certain articles which is likely to benefit *per se,* but that it is the nature of the residue which maintains the condition by acting as an irritant to the inflamed bowel. (2) Lavage.—The authors do not think highly of this, and, moreover, they are of opinion that the quantity of fluid used is of greater importance than its constitution. Silver preparations, however, are specially proscribed. (3) Operation.—This part of the question is ably discussed. The indications for operative measures are first stated. These are : signs of toxic absorption, marked haemorrhage, grave destruction of the mucosa as seen by the sigmoidoscope, the formation of bleeding polypi and the absence of improvement with lavage. The various operations, appendicostomy, caecostomy and ileostomy, are considered in turn. The first is the least satisfactory because it does not fulfil the end in view, namely, to rest the large bowel by preventing the entrance of intestinal contents into it. Caecostomy, of which the operative details are described, is better. It is preferably performed in two stages and after-care to protect the skin around the wound is important. Later, when there are no longer signs of toxic absorption, when the patient has improved in general appearance and has gained weight, and the large bowel, when examined from below by the sigmoidoscope and from above by a cystoscope through the caecostomy wound, is seen to be healed, the wound is closed. Lastly, ileostomy, though it precludes faecal matter from entering the large intestine, has the disadvantages of interfering with digestion, so that the gain in weight is less rapid, of frequently leading to excoriation of the skin from autodigestion, and of needing more frequent dressing, while subsequent closure of the bowel is more difficult. The fact that the specific organisms of dysentery play but a very small part in the later stages of the chronic disease explains the ineffectiveness of vaccines.

This paper will be particularly helpful in that the practitioner is not merely presented with a list of measures to choose from but is given reasons to aid him in making his choice.

H. Harold Scott.

WELCH (T. B.) & MASCARENHAS (C. J.). **The Treatment of Acute Bacillary Dysentery in African Labour.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 132–137. [2 refs.]

In the course of 388 consecutive cases of acute bacillary dysentery the authors became dissatisfied with the customary methods of treatment. The series is divided into two groups :—

(*a*) 183 cases from October, 1921, to September, 1922. Deaths, 18·6 per cent.

(*b*) 205 cases treated between October, 1922, and March, 1924. Deaths, 4·9 per cent.

Cases in group (*a*) were treated with salines, bismuth salts, pulv. rad. rhei and izal. Irrigation of the colon *per rectum,* and normal and hypertonic salines intravenously was given as occasion arose. The diets of patients were restricted, but results confirmed experience that in the African restriction is harmful. When more food was given, the faecal matter appeared to be retained in the bowel. The authors believe that this retention is, if prolonged, an important factor in the production of intoxication.

Considerations such as these led to a review of the methods of treatment with the object of preventing delay in the small and the large intestine. To patients in good condition are given two ounces of Ol. ricini on the day of admission and on the second and third day one drachm hourly during the daytime ; usually a second similar course is given. They are detained in hospital for fourteen days after the last mucus has been passed in the motions. The stools are inspected daily so as to avoid relapses. The average number of days till the last symptom was noted in the second group is 10½. In dealing with native labour the great value of this method is its simplicity.

P. H. M-B.

WEBSTER (Reginald). **The Results of the Serum Treatment of Bacillary Dysentery in Children.**—*Med. Jl. Australia.* 1924. July 5. 11th Year. Vol. 2. No. 1. (Supplement.) pp. 475–476.

The 66 children included in this series were subjected to a rigid bacteriological control. 57 were infected with Flexner's bacillus and 9 with the Sonne bacillus.

The following statistics emerge :—

Total number of children	66
Gross mortality	56 per cent.
Total mortality of the non-serum-treated ...	40·5 „ „
„ „ „ serum-treated	75·8 „ „

Results of serum injected on or before the fifth day :—

First Injection of Serum.	Number treated.	Recovered.	Died.	Mortality.
On or before fifth day ...	9	4	5	55·5 per cent.
After fifth day or none ...	57	25	32	56·1 „ „

It has been the experience at the Children's Hospital that children who contract dysentery due to the Flexner bacillus when they have passed the age of infancy do well irrespective of serum treatment. The fairest presentation of the results may be embodied in a table from which all who received their first injection later than the fifth day are regarded as non-serum treated and children over two are omitted.

First Injection of Serum.	Number treated.	Recovered.	Died.	Mortality.
On or before fifth day ...	9	4	5	55·5 per cent.
Later than fifth day ...	47	15	32	68 „ „

Average quantity of serum given ...	115 cc.
Smallest single dose employed	20 cc.
Largest single dose employed	250 cc.

The serum was administered by the subcutaneous and intraperitoneal routes.

P. H. M-B.

CRUZ (J. da Costa). **O bacteriophago em therapeutica.**—*Brazil-Medico.* 1923. June 2. Year 37. Vol. 1. No. 22. pp. 298–300. [3 refs.]

The author places on record an interesting series of cases of bacillary dysentery treated by bacteriophage with marvellous results. Twenty-four cases are given, the ages of the patients varying between 2 and 42 years. In twelve of them bacterial examination of the faeces was carried out and Hiss' bacillus was isolated 6 times, Flexner's 4, and Shiga's once. From one no organism was obtained. The stools of the remaining twelve were not examined bacterially.

There is marked similarity between the cases so that they can be grouped together. All, except one, were acute and all were passing frequent stools with mucus and blood. The bacteriophage was given by mouth in doses of 2 cc., usually once daily. In the chronic case, a man aged 36, who had had the disease for some years, no benefit resulted, but in the others pain ceased in a few hours, the stools were rapidly reduced in number and cure was obtained within 3 days, in some instances even less.

As regards the bacteriophage employed, the one mentioned is that from Shiga's bacillus; whether that was used throughout is not stated. [In view of the previous contradictory records of the effects noted by D'HÉRELLE on the one side and OTTO and MUNTER on the other the remedy is one which merits and will doubtless be given further trial.]

H. Harold Scott.

CRUZ (J. da Costa). **Le traitement des dysenteries bacillaires par le bactériophage.**—*C. R. Soc. Biol.* 1924. Oct. 7. Vol. 91. No. 28. pp. 845–846.

During the last year the author prepared some 10,000 bottles of bacteriophage for distribution to hospitals in Brazil. The results obtained by various medical officers go to confirm the author's own experience of its value. He considers it superior to any other, because the symptoms ameliorate considerably within 4–8 hours and the patient is generally convalescent in 48. The cases which are not benefited are comparatively rare. Two fatal cases are recorded. The use of antidysenteric serum is still recommended in Shiga infections, as the dysenteric toxin is not entirely neutralized by the bacteriophage. Apparently chronic colitis of undetermined nature is considerably improved, and in some cases cured, by bacteriophage.

P. H. M-B.

SUDMERSEN (H. J.), RUNGE (B. F.) & O'BRIEN (R. A.). **Standardization of Anti-Dysentery (Shiga) Serum.**—*Brit. Jl. Experim. Path.* 1924. Apr. Vol. 5. No. 2. pp. 100–104.

The preparation and standardization of a "test" toxin and antitoxin are here described. Mice and rabbits were used, intravenous inoculation being employed throughout. The toxin is prepared by growing Shiga's bacillus on nutrient agar for 48 hours, washing off in distilled water and heating to lethal point, 58–60° C., for ten minutes, centrifuging and rapidly drying in a desiccator. Great variability in the potency of toxin was experienced; "rough" colonies may produce as good toxin as smooth ones. Mice of 20 gm. were used for all confirmatory tests. The *minimal lethal dose* appeared to have a wide range; 0·04 mgm. was needed to produce a fatal result in all mice, whereas some died when given 0·005 mgm. The test dose of toxin is made up to 1 cc. with normal saline solution and contains a weighed amount of toxin together with 0·025 cc. standard antitoxin. The mixture must be allowed to stand 30 minutes before injection. The standard antitoxin (C. 950) was chosen because it is apparently stable and the amount, 0·025 cc., is necessary to protect mice and rabbits against 10 lethal doses of toxin. For testing sera 0·2 mgm. of toxin "AA" has been adopted as the test dose. A table is given summarizing experiments by two investigators working independently to ascertain the ratio between the dose of toxin which, when mixed with 0·025 cc. of antitoxin, would cause 100 per cent. of deaths and those causing approximately 20 per cent. of deaths. The interval between the doses was found to be much wider than in standardization tests of diphtheritic and antitetanic sera.

As regards rabbits, great variation in the lethal dose of toxin was discovered, so that ultimately the dose chosen as a test dose of toxin was one which mixed with 0·025 cc. of serum C. 950 would kill all the rabbits injected; this dose proved to be 0·2 mgm.

P. H. M-B.

KOLLE (W.), SCHLOSSBERGER (H.) & PRIGGE (R.). **Ueber Eigenschaften, Wirkungsart und Wertbestimmung des Dysenterieserums.** [Dysentery Serum, its Properties, Mode of Action and Evaluation.] —*Deut. Med. Woch.* 1924. Aug. 15. Vol. 50. No. 33. pp. 1105–1108. [15 refs.]

The authors note the lack of unanimity of view on the pathogenesis of bacillary dysentery. The object of their paper is to set forth the methods of preparing antidysenteric serum, the indications for its use and its mode of action. They agree with other investigators that the mouse is the most suitable laboratory animal not only for the testing of the virulence of the toxin, but also for estimating the curative effect of the antisera. Parallel results are obtained by using rabbits. They disbelieve in the duality of dysenteric toxin and were unable to obtain proof of the existence of an endotoxin. The toxin obtained by various methods from filtered bouillon cultures of Shiga-Kruse bacilli, from dried watery extracts, when mixed with antidysenteric serum, gave uniform results. On the other hand, very different results were registered with homologous or heterologous toxins. For instance, a typhoid-immune serum has apparently no neutralizing action upon the toxins of Shiga-Kruse bacilli.

Experiments made with living dysentery bacilli and antidysenteric serum in mice suggest that improvements in the rapidity and sureness of its antitoxic properties are highly desirable. The antitoxic properties of therapeutic antidysenteric serum must be considerably raised. Antidysenteric serum is a real antitoxic serum. The combination of antitoxin with the appropriate toxin follows the law of multiple proportions. Before a definite opinion on the curative properties of antidysenteric serum can be formulated further series of trials on dysenterics with highly potent therapeutic sera are necessary. The German standard toxin-test has been verified and confirmed by this work ; the authors, however, recommend that the dose of toxin should be doubled, for which purpose the preparations of the dried toxin have proved satisfactory.

P. H. M-B.

KONDO (Seigo). **Ueber die Auswertung der antitoxischen Dysenteriesera am Kaninchen.** [Evaluation of Antitoxic Dysentery Sera in Rabbits.]—*Muench. Med. Woch.* 1924. Sept. 26. Vol. 71. No. 39. pp. 1360–1362. [12 refs.]

The standardization of the antitoxin content of antidysentery serum, in order to obtain a constant unit, can be carried out in white mice and in rabbits. Apart from the higher cost of rabbits, Kondo considers the results obtained are by no means superior to those obtained from intravenous injection of white mice ; they are, however, comparable. It is difficult, if not impossible, to obtain rabbits of approximately the same weight, besides which the animals differ considerably in their susceptibility to one particular brand of toxin. The author considers that injection of serum and toxin into the animal on separate occasions or simultaneously are equally untrustworthy. On the other hand, the toxin-value should first be ascertained by mixing *in vitro*, and the mixture should be injected in separate fractional doses till the effects of the toxin are completely neutralized. He considers that in this basal fact the comparative therapeutic inefficacy of antidysenteric serum is to be explained.

P. H. M-B.

KANAI (S.). **Dysentery Immunization in Rabbits by the Oral Method.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 524–527.

Attempts were made to immunize rabbits against dysentery by the oral administration of killed vaccines by the Besredka method, three doses of one-fifth of a Roux bottle of dysentery bacilli being given ; the results were compared with those of a series of rabbits immunized by subcutaneous injection of three doses, one of 50 and two of 100 million. It was found possible to produce a certain, but small, degree of immunity by the oral method, but far inferior to that produced by the subcutaneous inoculation of carbolized vaccine. Attempts to secure a solid active immunity by oral and subcutaneous injections of killed vaccines against the soluble toxin of *B. dysenteriae* (Shiga) injected intravenously have not been attended by striking success. The antibody-content of the serum of rabbits immunized *per os* is appreciably raised.

P. H. M-B.

LESBRE (Ph.) & VERDEAU (A.). **Essai d'immunisation expérimentale par voie buccale contre la dysentérie à bacilles de Shiga.**—*C. R. Soc. Biol.* 1924. Oct. 24. Vol. 91. No. 29. pp. 883–885. [1 ref.]

The authors endeavoured to ascertain the protection produced by immunization *per os* in rabbits. For this purpose six rabbits of the same weight (2 kilogrammes) were inoculated by means of a sound, with 1·5, 2·5, 5 or 10 cc. of a 3-day bouillon-culture of killed Shiga bacilli. The two animals which received the higher dose died 3–5 days afterwards. The four survivors were injected intravenously with 1 cc. of a bouillon-culture of the same organism. All died within twenty-four hours. No antibodies could be demonstrated in their serum. In the second test another series of rabbits received by ingestion 12–20 milliards of organisms. After intravenous injection 11–21 days afterwards, death took place and autopsy revealed characteristic intestinal lesions. In a third series it was ascertained that no immunity was produced 16 days after vaccination. In the fourth series of 9 rabbits the results were inconclusive. To summarize:—24 rabbits ingested on one or more occasions Shiga bacilli in doses from 4–36 milliards. Four died as the direct result ; 13 died after intravenous injection as rapidly as did the control animals ; 2 developed paralysis as the result of this injection ; 1 recovered ; 1 was resistant, and this particular animal had been inoculated subcutaneously ; 4 were entirely refractory to intravenous injection and all had received massive doses by the mouth.

P. H. M-B.

i. NEUFELD (F.). **Zur Wertbestimmung des Ruhrheilserums. Nach Versuchen von Dr. Papamarku, früherem Assistenten am Institut.** [The Evaluation of Antitoxic Dysentery Serum.]—*Deut. Med. Woch.* 1924. Aug. 1. Vol. 50. No. 31. pp. 1043–1044. [2 refs.]

ii. PŘIBRAM (Ernst). **Die Diagnose und ätiologische Therapie der Bacillenruhr**—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 1/2. pp 15–18.

iii. PHEAR (Arthur G.). **The Treatment of Dysentery. I.—Bacillary Dysentery.**—*Lancet.* 1924. Aug. 2. pp. 232–233.

i. Killed agar-cultures of dysentery bacilli are preferable to bouillon toxins for the purpose of testing antidysenteric sera. In experiments on mice no comparison can be sustained between the antitoxic titre of sera and their anti-infectious properties.

ii. A text-book account of the etiology, pathology, diagnosis and treatment of bacillary dysentery containing no original observations.

iii. This article calls for little comment. The author's method of treating acute and chronic bacillary dysentery is based upon sound and generally accepted lines.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

ACTON (Hugh W.) & KNOWLES (R.). **On the Dysenteries of India.**—*Indian Med Gaz.* 1924. July. Vol. 59. No. 7. pp. 325–336. With 1 plate. [22 refs.]

That recent advances in the means of differentiating types of dysentery have hardly been appreciated in India is shown by the almost universal use of emetine in bacillary dysentery, a line of treatment which may inflict irreparable damage. The position of *Balantidium coli* as a cause of dysentery is still obscure, while *Schistosoma mansoni*, not being an indigenous parasite, can be eliminated and dysenteries associated with malaria and kala-azar are generally of amoebic or bacillary origin. The experience of the authors during the years 1920–1923 is that bacillary dysentery is at least five or six times as common in Calcutta as amoebic dysentery. This disease is relatively frequent in the wind-swept desert regions, whereas that is common in the city districts where the water supplies may be contaminated. Bacillary dysentery is an acute febrile disease necessitating in-patient treatment, while amoebic is characteristically an out-patient dysentery. Amoebic ulceration may be present in the colon without evoking any symptoms of disease, as in the autopsies cited of two lascars accidently suffocated in a barge in Mesopotamia in 1917. In bacillary dysentery the blood in the faeces tends to be of a bright red colour, whereas in amoebic it is darker and browner; in the former the reaction is alkaline to litmus paper, in the latter acid, the pH being about 6·3, as in the accompanying table:—

	No. of observations.	pH findings: mean and standard deviation.
E. histolytica, actively motile	25	6·35 ±0·2988
E. histolytica, dead or dying, vegetative	22	7·00 ±1·1118
E. histolytica, cysts	51	7·24 ±0·2535
Charcot Leyden Crystals present ...	54	6·96 ±0·2909
Bacillary Dysentery Stools	23	8·11 ±0·1679

In the absence of *E. histolytica* it is possible to give a diagnosis of the type of dysentery from a study of the cellular exudate in the stool, for which purpose a stereoscopic binocular eye-piece (× 12·5) with $\frac{1}{7}$ in. oil-immersion objective is the most useful. Besides the familiar features of the cellular exudate, a study of the red blood corpuscles is useful. In amoebic dysentery they tend to collect in rouleaux, in bacillary there is an absence of any change in these cells. The appearance of Charcot-Leyden crystals is almost pathognomonic of amoebic infections. Mixed dysentery may occur; the authors have treated patients for amoebic dysentery who have subsequently returned with an attack of bacillary, and the latter may supervene in an *E. histolytica* carrier. Examination of a stool more than two hours after it has been passed is useless. If specimens have to be sent to a distant laboratory, films of mucus should be dropped into Schaudinn's fixative and subsequently stained. The present method adopted by the authors is as follows:—

(1) The patient is kept strictly in bed for ten days.

(2) A milk diet having been prescribed, the patient is treated for the first six days on the following lines:—Early in the morning a full dose of saline aperient is given to clear out the colon ; this is followed by DEEKS' bismuth treatment—2 drachms of bismuth carbonate every four hours, administered in half a glassful of water, preferably soda water. The tendency is to convert the acid colon contents to alkalinity, which is unfavourable to the entamoebae. Two and a half hours after the first dose of bismuth one grain of emetine hydrochloride is given subcutaneously ; the drug exerts its maximal effect in an alkaline medium. After six days of this treatment all drugs, except the administration of a morning saline aperient, are suspended for three days. Emetine inoculations are now recommenced till the patient has received 12 injections, which are as much as he can safely stand. An intestinal antiseptic, such as Yatren (No. 105 Behring Werke iodo-oxyquinolin-sulphonic acid) is given in 7½ grain pills three times on the first day, six on the second, third and subsequent days. Clinically it is of value, presumably due to the liberation of quinolin in the colon. If pushed the drug has a tendency to cause diarrhoea. If six consecutive daily examinations of the stool have failed to show *E. histolytica* the patient can be discharged from hospital, but it by no means follows that he is absolutely cured. The after-cure consists in taking three times daily two drachms of extract of Kurchi for three weeks. Chronic amoebic cases should receive vaccine treatment of intestinal streptococci.

Chronic bacillary dysentery should be treated with vaccines of dysentery bacilli combined with potassium iodide by the mouth. Chronic dysentery leads in time to the production of the " chronic abdomen "—in both types of chronic dysentery adhesions may have formed, especially at the flexures, and visceroptosis result. Such patients show a well-marked syndrome of alternating constipation and diarrhoea. Together with mechanical obstruction and muscular defect a toxaemia occurs from absorption of intestinal toxins. In adult female patients there is an endocrine deficiency, the ovarian and thyroid mechanism being specially affected. A well-fitting abdominal belt should be provided, and glandular therapy ⅛–¼ of a grain of dried thyroid extract combined with 2 grains of dried ovarian extract daily. [This paper is illustrated by a most admirable plate.]

P. H. M-B.

HAUGHWOUT (Frank G.). **Observations on the Interpretation of the Microscopic Picture in Dysentery and other Intestinal Disorders.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 482–512. With 14 figs. [19 refs.]

This paper is an appeal to the general practitioner in the tropics to make himself familiar with the differential diagnosis of the dysenteries, and especially to understand and to appreciate the interpretation of the microscopic picture of the exudate in the faeces (cytodiagnosis).

It is the author's opinion that any physician who has been properly trained could be taught in a few weeks' study to make a quick and safe diagnosis in dysentery with the equipment of a microscope and a few simple reagents. One of the most important demonstrations during recent years is the relative infrequence of amoebic dysentery. In dealing broadly with the intestinal problem, it must be understood that non-specific gastro-intestinal disorders are of frequent occurrence in the tropics, and in the large cities usually outnumber the dysenteries; but in view of the information gathered since the war, it may be stated that bacillary dysentery is always the predominating form of dysentery, and may be said to exceed that of protozoal origin by 9 : 1. The Government of every country in the tropics, as a part of the general public health programme, should make it possible for every physician in the public health service to receive a course of coprology. In applying the method of cytodiagnosis to dysentery and other affections, the cardinal principle is to fix clearly in mind the cellular picture of *acute bacillary dysentery*. Pus of itself does not necessarily betoken bacillary dysentery if macrophages and ghost cells are absent. In making a diagnosis of dysentery from a study of the exudate, the following points should be borne in mind:—

(1) Exclude bacillary dysentery; this is not difficult to do, particularly two or three hours after the onset.

(2) Make no diagnosis of amoebic dysentery except on the findings of amoebae certainly *E. histolytica.*

(3) Cases of balantidial dysentery should be studied with special care, as the exudate closely resembles that of bacillary dysentery. It is very easy to miss the diagnosis in a bacillary dysentery developing in a carrier of *Balantidium coli.*

Cases illustrating various points are cited. The remainder of the paper consists of a résumé of the literature of dysentery.

P. H. M-B.

HAUGHWOUT (Frank G.). **The Microscopic Diagnosis of the Dysenteries at their Onset.**—*Jl. Amer. Med. Assoc.* 1924. Oct. 11. Vol. 83. No. 15. pp. 1156–1160. With 3 text figs. [7 refs.]

This paper is to a great extent a repetition of an earlier one (see above). In the author's opinion too much has been written for the consumption of the general practitioner on amoebiasis and amoebic dysentery. Such aids to the identification of the protozoa tend to bewilder; very little protozoology, indeed, is learned from printed descriptions and figures. It is possible for any physician with a microscope to make an easy and correct differential diagnosis of the dysenteries. The three essentials in the successful management of a case of dysentery are:—

1. Its differentiation from acute diarrhoea or other intestinal disorders.
2. The early and accurate determination of the type.
3. Prompt, adequate and sustained treatment with the appropriate remedy as indicated by the laboratory findings.

A fatal outcome in dysentery is usually due to one of the following causes:—(1) Delay on part of patient seeking medical advice; (2) failure to make correct diagnosis; (3) failure to administer treatment in adequate dosage; (4) failure to treat complicating symptoms; (5) inability to counteract overwhelming toxaemia, and (6) neglect of secondary infection supervening.

P. H. M-B.

LINS (Abdon). **Sobre o *Spirochaeta eurygyrata* e a Dysenteria espirillar.**—*Arch. Brasileiros de Med.* 1924. July. Vol. 14. No. 7. pp. 420–426. [23 refs.]

The *Spirochaeta eurygyrata* is described, and its staining reactions and other properties. Cultural and inoculation experiments proved negative. As to pathogenicity the author concludes that, as a rule, it is only saprophytic, though not impossibly it may at times penetrate the epithelial lining and become pathogenic. He failed to find it in 11 cases of dysentery, but it was present in 27 out of 39 patients with loose stools, and in 33 per cent. of apparently healthy persons whom he examined.

H. Harold Scott.

BERNARD (Léon) & THOMAS. **Sur deux cas d'éntero-colites à protozoaires guéris par le stovarsol.**—*Bull. Acad. Méd.* 1924. June 24. Year 88. Vol. 91. 3rd Ser. No. 26. pp. 800–804.

Two rather remarkable cases are here recorded. Both patients had lungs badly damaged by tuberculosis, besides being long sufferers from painful enteritis. The first was a boy of 17 years, with a history of diarrhoea and colic of several years' duration; his stools contained many Giardia cysts. After an 8 days' course of stovarsol (0·25 gm. daily) the parasites, encysted and free, were still present. At an interval of 11 days he was again put for 19 days on the same daily dose of stovarsol, after which his stools became of normal consistence, and the parasites disappeared, although frequently searched for during the following 40 days. The second case was a man of 47, who had suffered from dysentery for about 17 years, with recurrent exacerbations of tenesmus and slimy and bloody flux; his larynx as well as his lungs were badly affected with tubercle, and he was also syphilitic; when admitted, emaciated and full of wretchedness, he was in one of his acute relapses, and multitudes of *Balantidium coli* were found in his evacuations. After a first course of stovarsol—0·50 gm. daily (in four doses) for 9 days—the Balantidia were still observed. At an interval of 11 days the daily stovarsol was repeated for a term of 24 days, in the course of which the stools became normal and the Balantidia disappeared. In neither of these cases was the tubercle trouble worsened by the stovarsol. The authors expatiate on the happy results of examining stools in every case of diarrhoea, leaving nothing to inference.

A. A.

CAMPOS (Ernesto de Souza). **Contribuição para o estudo anatomopathologico da dysenteria balantidiana.**—*Sciencia Medica.* Rio de Janeiro. 1924. July 31. Vol. 2. No. 7. pp. 331–359. With 10 text figs. [73 refs.]

A minute description of naked-eye and microscopical changes, found in the large intestine of a child dying two days after admission to hospital, suffering from infection with *Balantidium coli*. Much of the paper is occupied by a comparision of these changes with those recorded by others. The whole of the large intestine from the appendix to the rectum was involved. With the exception of small ulcers and some superficial necrosis and an enlargement of the lymphatic glands (and these were not characteristic), there was nothing particularly noteworthy to the naked eye. Microscopically, the necrosis involved the mucosa and adjacent part of the submucosa only. The lesions were least marked in the appendix, but the parasites were present in considerable numbers throughout the large intestine and in all the coats. The vessels contained many. Those in the superficial layers were disintegrated, the deeper ones stained clearly. In their neighbourhood was marked round- and plasma-cell infiltration, and in the muscular tissue they were disposed along the muscle-planes and surrounded by a clear zone " like a trench dug by the parasite in traversing the intestine," but in spite of the large number of Balantidia in this region there was no necrosis. In the rectum there were bands of granulation tissue in a direction perpendicular to the wall. The lymphatic glands showed large numbers of Balantidia, in fact some of them seemed to be packed with them. Although many were found in the blood-vessels locally, examination of the other organs—lungs, stomach, duodenum, liver, kidney, pancreas and brain—revealed none, whence it would appear that the parasites are destroyed in the blood-stream. Eosinophilia was but slight.

H. Harold Scott.

OI (Tsukasa). [**A Contribution to the Knowledge of Balantidium Enteritis in Formosa.**]—*Tokyo Ijishin-Shi* (*Tokyo Med. News*). 1924. June. No. 2375. [Summarized in *Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. p. 239.]

The author found 6 cases of balantidium enteritis in Formosa. He believes that more cases could be discovered if more bacteriological examinations were undertaken.

P. H. M-B.

ZIEMANN (Hans). **Zur medikamentösen Ruhrtherapie.**—*Deut. Med. Woch.* 1924. Sept. 5. Vol. 50. No. 36. pp. 1220–1221.

This paper appears to be an abridged clinical account of dysentery on text-book lines. The death-rate from bacillary dysentery amongst German troops, at the commencement of the war, is stated to have been 8 per cent. Ziemann himself has never seen a fatal case where the saline treatment has been properly carried out.

P. H. M-B.

DELANOË. **Au sujet des dysenteries à Trichomonas. (Réponse à MM. Dekester et Melnotte.)**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 557–558. [3 refs.]

Delanoë claims priority for pointing out the pathogenic import of *Trichomonas intestinalis* in Morocco.

P. H. M-B.

SPRUE.

Jones (I. Davenport). **Is Lymphatic Obstruction a Factor in Sprue?** [Correspondence.]—*Lancet.* 1924. Sept. 6. p. 525.

Two cases of spure were subjected to operation for suddenly developed appendicitis in Bombay. Opportunities such as these seldom occur. The ileum was seen to be attenuated, while distension and varicosity of the lacteals in the mesentery attached to the jejunum were very apparent. No evidence of intestinal ulceration was obtained. This condition, never having been previously observed in the author's considerable experience of abdominal surgery, may shed some light upon the etiology of sprue. Delay in the lymph flow probably takes place in the sclerosed lymph-glands in the mesentery. Lymphatic obstruction may be the predominant factor. It is conceivable that the continuous absorption of toxin from the intestinal mucosa will eventually produce sclerosis of the mesenteric glands, and so cause lymphatic obstruction. There is no other intestinal disease in the whole range of medicine in which such a toxic process must be continuously taking place as in sprue.

P. H Manson-Bahr.

Smith (Lawrence Weld). *Monilia psilosis* **Ashford in Severe Anaemia associated with the Sprue Syndrome.**—*Philippine Jl. Science.* 1924. Apr. Vol. 24. No. 4. pp. 447–465. With 1 plate. [17 refs.]

This paper records the isolation of a Monilia which culturally, serologically and morphologically corresponds with Ashford's *Monilia psilosis*. A small group of cases was seen with great anaemia, resembling pernicious anaemia in severity and rapidity of course, but with few of the morphological changes in the blood commonly found in this condition. The red-cell count in typical advanced cases was under one million corpuscles, while the leucocyte count is correspondingly diminished to three thousand or less per cubic millimetre. The blood-platelets are absolutely decreased to from 100,000 to 150,000, as a general rule. The haemoglobin percentage is usually from 30 to 40, thus giving a high colour index. There are usually no nucleated red cells, nor any stippling or polychromatophilia. In other words, it is an idiopathic aplastic anaemia. The anaemia is associated with chronic pale, frothy stools, such as usually occur in sprue. Eight cases are quoted, in which *Monilia psilosis* was isolated from tongue scrapings and from the stools. Complement fixation with yeast antigen was usually positive. The methods employed in obtaining the Monilia were essentially those of Ashford. The identification of the Monilia by sugar reactions and the method of performing the complement-deviation test are described.

Neither in guineapigs nor rabbits has the author been able to reproduce the blood picture seen in human cases, but he thinks there is sufficient evidence to blame *Monilia psilosis* for the production of this severe anaemia.

P. H. M-B.

VAN DER SCHEER (A.). **Tropische spruw en pernicieuze anaemie.** [Tropical Sprue and Pernicious Anaemia.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 20. Vol. 68. 2nd Half. No. 12. pp. 1468–1486.

In tropical sprue the microscopical constitution of the blood sometimes greatly resembles that of pernicious anaemia (of ADDISON). Both, moreover, have in common the affection of the buccal cavity, although this is more common in sprue ; but, although affection of stomach and intestine occur in both, in pernicious anaemia achylia gastrica is the rule, in sprue intestinal trouble (white diarrhoea, disturbed fat-absorption). Instances are given showing, also in sprue, the symptoms of accelerated blood-destruction : increased quantities of bilirubin in the blood and sometimes of urobilin in the faeces. This destruction, however, never reaches a degree comparable to that observed in pernicious anaemia.

Pernicious anaemia is said to be caused by the accelerated blood-destruction together with a diseased condition of the haematopöietic organs (bone marrow). How is it in sprue ? The author's hypothesis has been for a long time that sprue is due to the inability to neutralize toxic products formed in the intestine. This intestinal intoxication is favoured by rich nutrition ; in Netherlands India the author observed a prevalence of the disease among the well-to-do classes, and a recrudescence of symptoms in convalescents after injudicious efforts to strengthen them by more food.

Physiological investigations have demonstrated that the haemolytic action of higher fatty acids (oleinicyacid, palmitinicyacid), which provoke haematological changes analogous to pernicious anaemia, can be prevented by small doses of calcium. The author's conception of the etiology of sprue is that great quantities of higher fatty acids are absorbed by the intestinal wall, whereas the absorption of calcium is inhibited by its being fixed by the acids still present in the intestine. The author points out that tetany, often found in patients suffering from sprue, is supposed to be caused by a disturbed calcium metabolism and that large doses of calcium, administered per rectum in cases of sprue, are known often to influence this disease favourably.

The presence of fatty acids in the intestine, the primary condition to produce sprue in this hypothesis, which in the case of alimentary anaemia is caused by a diet too rich in fat, is, in the case of sprue, provoked by an insufficient digestion of the fat, even if the latter is present in the food in normal or subnormal quantities. This disturbance of the digestion, by causing likewise abnormal fermentations and secondary diarrhoea, may provoke an insufficient absorption of the food as a whole, leading to conditions analogous to those produced when the food itself is deficient, so rendering the state of the patient still worse. Both factors, (1) disturbed digestion of fat with its consequences : free fatty acids admitted to the circulation and fixation of calcium before absorption ; (2) the deficiency disease caused by the disturbance of general absorption, collaborate to produce the various symptoms of sprue and are both favourably influenced by a judicious diet.

N. H. Swellengrebel.

DURAN (Carlos). **Some Observations on " Sprue " in Costa Rica.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp. 393–395.

Sprue is a common disease in Costa Rica; some cases are so characteristic that a mistake in diagnosis is impossible; in others chronic diarrhoea is the only symptom, but its cessation on a special dietary is almost diagnostic of the disease. A case is related in detail of a man over seventy years of age who, despite his very debilitated condition with oedema of the extremities, regained his health. ASHFORD's diet, which excludes cane-sugar and flour, was given.

P. H. M-B.

SCOTT (H. Harold). **Remarks on Recent Advances in the Treatment of Sprue :** *Calcium and Parathyroid.*—*Brit. Med. Jl.* 1924. Aug. 23. pp. 305–308. [4 refs.]

In continuation of previous contributions to this subject, Scott now records the course of sprue cases treated with calcium and parathyroid. The first case cited was treated on familiar lines; at the end of thirteen weeks he suffered from a relapse and at the end of twenty-three weeks was discharged from hospital still partaking of a very simple diet, including 5 pints of milk. Consideration of his symptoms, detailed in the résumé, shows that this was a mild case; there had been no cramp, the soreness of the tongue was but slight, and the loss in weight had amounted to only 20 lb. in two and a quarter years.

In the next 2 cases compared (iii and iv) the first was treated by the usual method of diet and rest; the second by the calcium lactate and parathyroid method. The increase in weight in this instance was 15 lb. The patient stayed in bed for a fortnight, and at the end of that time was taking milk, milk puddings, fish, chicken and green vegetables. In a month's time he was eating meat (mutton). He returned to India in February 1924 (4 months after his home-coming), and has since remained well.

Two parallel cases of moderate severity are next compared. The first of these was in hospital thirteen weeks and, at the end of that period, was partaking of milk, 6 pints, 3 eggs, 2 sago puddings, each of 4 oz., pounded fish and liver soup. The calcium-treated case was in hospital four weeks, during which time he had increased 28 lbs. in weight. The ionic calcium content of his blood rose from 7 mgm. per cent. to 10·8 per cent. He was on a liberal diet of eggs, milk puddings and fish.

Case vi is inserted to illustrate that the disturbance of parathyroid in sprue is functional only, and that when once it has cleared up, there is apparently no necessity to continue treatment. An elderly patient, who had had the disease on and off for at least 14 years, put on 31 lbs. in weight, left hospital, well, in 7 weeks, and when seen, after the lapse of one year, had not required to take any more calcium or parathyroid, nor had any return of symptoms.

Case vii is cited as indicating that calcium in the form of *pulvis Bataviae Co*, though masking the symptoms, does not stabilize the improvement, in the absence of parathyroid. Case viii was a lady, who had suffered from marked sprue symptoms in China, with very marked attendant anaemia (1,000,000 red cells per cmm.). On calcium lactate and parathyroid she was soon permitted underdone beef, mutton chops, etc. On arrival in England she was found to be in normal health with no symptoms of sprue. The case is cited as showing that with the return of the ionic calcium to normal, ordinary diet can be resumed in a shorter time. As a rule, it has been found that the fuller diet provides all the calcium needed, so that this element may be omitted, but that the parathyroid, as regulator, must be continued for another week or so. Two more cases (ix and x) are quoted in order to demonstrate the tardiness of improvement when parathyroid is exhibited in half the customary quantities.

The paper concludes with an account of successful results which are being obtained in the endemic foci of the disease, together with a recital of two cases in which death ensued with symptoms of pernicious anaemia. In these cases the parathyroid treatment was commenced only in the last few weeks of life.

P. H. M-B.

COATES (Vincent). **Treatment of Sprue by Calcium and Parathyroid.** [Correspondence.]—*Brit. Med. Jl.* 1924. Oct. 4. p. 623.

This is a short résumé of two sprue cases, both from India, treated in Bath, on the lines laid down by H. H. SCOTT. The first was in a young man of 22, the second a lady of 45. In both cases, in addition to the calcium lactate and parathyroid treatment, the dietary was carefully regulated. Both have done well and no relapse has been noted. But a short period has elapsed since cessation of treatment—March 5th and June 14th, 1924.

P. H. M-B.

MALARIA.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. Trans. Fifth Biennial Congress, Singapore, 1923. pp. 15–127. III. **Malaria.** [WATSON (M.), WELLINGTON (A. R.), HOWARD (S. C.), STOOKES (V. A.), WALCH (E. W.), KOIDZUMI (M.), CHRISTOPHERS (S. R.) & KUNO (Y.).] **Malaria and Insanity,** pp. 128–147 [van LOON (F. H.) & KIRSCHNER (L.) & SAMUELS (W. F.)].

Opening Address on Malaria. [WATSON (Malcolm).] pp. 15–20. With 1 chart.

The Opening Address on malaria at the Fifth Biennial Congress of the Far Eastern Association of Tropical Medicine held at Singapore in 1923 was by Malcolm Watson. It is a striking illustration of the fact that it is to those whose knowledge of any scientific subject is the deepest that there comes the realization that they are but on the fringe of the matter. We read :–

"We have hardly begun the great campaign against malaria yet. . . . In the past 25 years we have been scouting rather than fighting. . . . Different places require different methods of attack. . . . A method successful in one place may aggravate the disease in another. . . . We do not know why one species of Anopheles is a carrier of malaria, and another, hardly to be distinguished from it, is not. We do not know why one species lives in one breeding-place and another species in another. We do not know why one ricefield contains one group of Anopheles and another contains another group."

It is indeed well that one of Watson's standing should have yet another stab at the bubble of self-satisfaction which glistens so beautifully in so much of the work of medical zoology. Proof of Watson's contentions are found throughout the other papers.

The History of Malaria at Gemas. [WELLINGTON (A. R.).] pp. 21–29.

Wellington showed how in Gemas the opening up of the jungle undergrowth allowed the breeding of the pestilent *A. maculatus* with increase of malaria, malaria and its shade-hating carrier disappearing as the undergrowth crept back into its own.

Malaria Control on Rubber Estates in the F.M.S. [HOWARD (S.C.).] pp. 30–36.

Howard envisages a central bureau of malaria control for rubber estates which would deal with site selection, drainage, oiling, and the pruning of the bukar which grows among the rubber, so that it will neither become too tall and favour the growth of mouldy rot, nor be cut too short to provide the shade which *A. maculatus* cannot breed in.

Some Remarks on Malarial Epidemics caused by *M. Sinensis* (*A. Hyrcanus*). [WALCH (E. W.).] pp. 46–72. With 6 figs. [14 refs.]

Walch's paper has already been considered (this *Bulletin*, Vol. 21, p. 607). Of further interest is the good effect of quinine, given daily for several months, to certain communities; neighbouring communities equally affected by drainage schemes, having none.

The Measurement of the Enlarged Spleen. [CHRISTOPHERS (S. R.).] pp. 102–112. With 3 figs.

Christophers' paper on measurement of the enlarged spleen has in substance been fully considered (this *Bulletin*, vol. 21, p. 597). For the present purpose one point may be recalled. It showed that while the position of the umbilicus relative to the costal margin varied, this was because of the varying position of the costal margin. The umbilicus was probably not more variable than any other abdominal feature.

On an Index Line for the Determination of the Spleen Rate. [KUNO (Yas).] pp. 113–126. With 2 figs.

Kuno suggested as a base line for the measurement of the exposed portion of an enlarged spleen one reaching from the upper part of the inner edge of one clavicle to the opposite anterior superior iliac spine. He worked it out as being fairly constant, provided the body were not bent forwards, and suggested that one-tenth of its length might be taken as the basis for comparison with the extent of the exposed spleen. In practical facility it can hardly approach Christophers' suggested measurement from navel to the tip of the spleen, as mapped out along the normal route which the apex takes as the spleen enlarges.

Other papers are " Notes on the Control of Malaria in Sarawak," by V. A. STOOKES (pp. 38–45) ; " Observations on Habits of the Anophelines in Formosa " and " The Anopheline Mosquitoes of Formosa," by M. KOIDZUMI (pp. 94–95, 96–101) ; " Treatment of Dementia Paralytica by Malaria Inoculation in the Tropics," by F. H. VAN LOON and L. KIRSCHNER (pp. 128–140) [see below, p. 54]; and " Malaria and Mental Diseases," by W. F. SAMUELS.

Clayton Lane.

GILL (C. A.). **Malaria in the Punjab. The Epidemic Forecast for the Year 1923.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 185–193. With 1 map. [2 refs.]

The third annual malaria forecast for the Punjab is compared with the actuality. In certain districts the forecast proved incorrect. The reasons are considered. It is concluded:—

"It is proper to adopt a critical attitude towards predictions which claim to be based upon scientific principles regarding the occurrence of epidemics of disease, but in view of the degree of accuracy attained by three successive forecasts and of the independent testimony afforded on the present occasion of the facility with which an accurate forecast of epidemic malaria can be prepared, it is permissible to assume that the hypothesis upon which the method of forecasting is based is something more substantial than a mere epidemiological speculation."

C. L.

WATSON (Malcolm). **Remarks on Malaria.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 32–34.

The question of tolerance is strikingly illustrated by Malcolm Watson's statement that children so seriously infected as are those on Assam tea gardens and who yet look healthy, would in Malay look ill. The difference is attributed to Malaya labourers coming thither without, most of them, having suffered previously from malaria; whereas in Assam, which recruits one tenth only of its labour yearly, many children have been born in the garden, tolerance being, moreover, perhaps inherited.

C. L.

HENDRIKS (J. A.). **Uit de Malaria-epidemiologie.** [Malaria Epidemiology.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 3. pp. 353–402. With 3 charts.

This long article contains much, mostly statistical, information on malarial endemics and epidemics in Sumatra (Tapanoeli and Atchin). In Tapanoeli *A. ludlowi,* breeding in fishponds, is known to be a dangerous carrier, but the author incriminates also *A. aconitus.*

He had an opportunity of studying the time of incubation in soldiers, who stayed two nights in a malarious village; in subtertian, tertian and quartan fever it varied from 5 to 29 days (average 15, 18 and 19 days).

For the different types of endemics (chronic, seasonal, acute exacerbating) and epidemics (incidental in non-malarial people, permanently or temporarily settling in endemic regions, or real, caused by import of malaria carriers or (and) transmitting mosquitoes in a non-malarious country) the author outlines the sanitary measures to be taken. Much stress is laid upon quininization, which is most promising when carried out at the schools. Quinine is recommended in rather large doses (1 gramme twice a day for adults); the results of this method compare favourably with administration of the same quantity in smaller single doses. For prophylactic use quinine should be given 1 gramme every night for a fortnight after possible infection.

W. J. Bais.

CILENTO (R. W.). **Malaria in Australia.**—*Med. Jl. Australia.* 1924. May 17. 11th Year. Vol. 1. No. 20. (Supplement.) pp. 315–317.

This paper supplements that of MAPLESTONE (this *Bulletin,* Vol. 20, p. 961), whose information is held to have become out of date. It deals with local malarial distribution throughout Australia. Examination of 159 aboriginals and 54 half-castes at Port Darwin showed spleen rates of 22·6 and 31·5 respectively. *Anopheles (Nyssorhynchus) annulipes* and *A. (Myzorhynchus) bancrofti* are generally hypothecated as probable vectors, the former being common where malaria is prevalent. No proof on the matter exists.

C. L.

CILENTO (R. W.). **Malaria, with Especial Reference to Australia and its Dependencies.**—*Commonwealth of Australia Dept. of Health Service Publication (Tropical Division) No. 3.* 141 pp. With 35 figs. [32 refs.]

" A comprehensive summary of modern knowledge of malaria, orientated to the particular conditions and needs of Australia, and of those tropical Territories for whose welfare Australia is ultimately responsible." It is well written and well illustrated.

C. L.

i. BIJLMER (H. J. T.). **De Malaria. Met eenige aanvullende opmerkingen van H. de Rook, evenals eerstgenoemde officier van gezondheid bij de expeditie.** [From the Medical Reports of the Scientific Central New Guinea Expedition 1920–1921.]—*Geneesk. Tijdschr. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 600–631. With 1 fig. & 1 graph.

ii. DE ROOK (H.). **Specieel Anophelinen-onderzoek.** [Special Anopheline Research.] [From the Medical Reports of the Scientific Central New Guinea Expedition, 1920–1921.]—*Ibid.* pp. 642–656. With 1 folding plate.

i. The expedition intended exploration of the central highland of New Guinea, from the north along the Mamberaro river. The country was known as very malarious. The population of the base bivouac was about 400 (Europeans, native soldiers, native prisoners, Dayak rowers). Within a fortnight after arrival malaria cases occurred and within 6 months 96 per cent. of a group of 79 native soldiers were infected. In new batches of soldiers the epidemic ran a similar course. There were cases of tertian and subtertian fever; the severity of later attacks in the same individual diminished as a rule. Quinine prophylaxis, systematically carried out from the beginning (2 days a week 0·8 gm., later 0·4 gm. every day, afterwards 2 days a week 1 gm.), was not a success in preventing malarial infection; generally, however, the character of the attacks was benign, and this was ascribed to the quinine prophylaxis. New infections apparently played an important part.

Towards the end of the first, and in the beginning of the second, year of the expedition there were 11 cases of blackwater fever. These patients, at outposts out of reach of medical officers, had neglected quinine prophylaxis. Bijlmer thinks that blackwater fever can be prevented by methodical quinine treatment and early evacuation of persistent malaria cases.

At the bivouacs in the central parts of the country mosquitoes were innumerable. At the base the number of mosquitoes (*A. punctulatus*) appeared to be few, but increased after temporary inundations, when larvae were found in great numbers in small puddles, hoofprints, etc. Drainage of the site was practised as far as possible.

ii. A minute description is given of larva and imago of the two species found by the author. Both, *A. punctulatus* (Dönitz) and *A. punctulatus* var. *moluccensis* (Swellengrebel), are malaria transmitting species. The natural infection rate of the first was 1½–5 per cent. The two species mentioned must be distinguished from *A. tessellatus* (Theobald), which has been erroneously considered as *A. punctulatus* in the western part of the Malay Archipelago.

W. J. Bais.

LI (K. H.). **Malaria among Chinese University Students.**—*China Med. Jl.* 1924. Sept. Vol. 38. No. 9. pp. 737–742. [3 refs.]

Of 460 students of the Soochow University 395 claimed to be, or to have been, malarious; 124 had clinical symptoms and were found to harbour subtertian parasites in 20, tertian in 10, quartan in 6, and undifferentiated forms in 25 cases. A students' strike confused conclusions, but malaria is held to be the most potent cause of loss of class attendance. Large mononuclears averaged 17·75 per cent.

C. L.

SERGENT (Edm. & Et.), PARROT (L.), FOLEY (H.), SÉNÉVET (G.) & CATANEI (A.). **Études épidémiologiques et prophylactiques du paludisme. 20e, 21e et 22e campagnes en Algérie en 1921, 1922 et 1923.**—*Ann. Inst. Pasteur.* 1924. Sept. Vol. **38.** No. 9. pp. 775–786. [1 ref.]

It is interesting that the detailed association of rainfall with malaria which GILL has shown to hold so strikingly for the Punjab that from the precipitation in July and August the autumn malaria incidence has been forecasted with considerable accuracy, is mentioned in this paper as established for the spring rainfall in Algeria. Yet drought has produced malaria by driving malarial famine-striken people into less malarial parts, as of course has improper irrigation. In Algeria no protection for man by animal houses is experienced, the Anopheles apparently liking the w.c. as much as the adjacent animal house. In spring the splenic index of 4,531 persons was 35·7, the parasite index in 3,876 persons was 10·7, the gamete index in 3,866 was 2·6. Of 100 children, 20 harboured *Plasmodium falciparum,* 13 *P. vivax,* 17 *P. malariae,* and in 20 the form was undetermined. Prophylactic quinine in daily dose of 0·4 gm., the salt used last year being the sulphate, taken for 5 months in the year in the hills, for 7 months on the coast, and all the year round at Halia, was issued to 3,500 persons in 1921, 4,000 in 1922, and 10,000 in 1923. Small antilarval measures, mosquito gauze, and 4 sets of tracts complete the hygienic measures. It is held that grave attacks have been prevented, cachexia lessened and mortality considerably diminished.

C. L.

RAULT (M.). **Quelques faits relatifs au paludisme.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 503–507. With 2 charts in text.

At Tiaroye in French West Africa the spleen rate varies from 25 to 50 per cent In the day time 82 per cent. of mosquitoes caught in a house were Anopheles and 72 per cent. of these were females. At 7 p.m. there were no Anopheles, but by 11.30 p.m. they had reached 4 per cent. of the total, and 99 per cent. of them were females.

C. L.

PALESTINE. **Proceedings of the Ninth Meeting of the Antimalarial Advisory Commission, 22nd May 1924.** [HERON (G. W.), Director of Health, President.] [MS. received from Dept. of Health, Jerusalem.]

BRIERCLIFFE noted that, while the low malarial incidence of 1923 was attributable largely to a low rainfall, in some parts it was chiefly due to antimalarial measures. For example, in 1921 larvae were found once in 1,400 inspections, in 1922 once in 2,000 and in 1923 once in 6,600, while at the same time additional wells and cisterns are still being discovered and registered. Of the £31,000 estimated to have been spent on antimalarial measures, contributions from abroad account for a third, Government expenditure rather more than and municipal expenditure rather less than a tenth, while nearly half was spent by private persons. The British Garrison comprised 1,500 persons, including 350 gendarmes, and showed 30 cases of primary malaria.

TYRRELL observed that very weak cresol, 1 in 10,000,000 parts in running water, killed newly hatched mosquito larvae in 12 hours, although KLIGLER considered that the greatest dilution producing effective larval control was 1 in 10,000, TYRRELL pointing out that even such a dilution was tasteless.

Regarding length of flight, KLIGLER remarked that the catching, staining and releasing of mosquitoes involves risk of injury which must necessarily affect their powers of long distance flight. He believes that ascertaining the presence of a given species of Anopheles at different distances from its breeding places, provided they are all known, gives a more satisfactory basis. Observations are recorded indicating that the prevailing house-visiting mosquitoes, *A. sergenti*, *A. superpictus* and *A. multicolor*, usually fly a distance of 2 kms. At Ayelet, set on a hill, *A. elutus* was troublesome, though no breeding place nearer than 4½ to 5 kms. could be discovered. At Ain Hai, similarly placed, the range of flight is similarly put as 5 to 6 kms. WENYON'S similar Macedonian observations are noted.

SCHAPIRO considers spleen and parasite rates. In discussion the necessity of spleen examinations being carried out by one observer was emphasized and the value of percussion as a routine criticized; yet, after all, a main value of such observations lies in comparisons with similar ones in other years and in other countries, and if the ordinary technique be varied, and if it does not adequately eliminate individual tendencies, their value is little or none. Jews are more amenable to antimalarial measures than Arabs, and have correspondingly benefited by them.

C. L.

DE LAVERGNE (V.). **Comité d'hygiène de la Société des Nations et paludisme.**—*Rev. d'Hygiène.* 1924. June. Vol. 46. No. 6. pp. 541–560. With 1 graph.

The Malaria Commission of the Public Health Committee of the League of Nations has addressed a questionnaire to all nations concerned ; the reply received from Italy is here summarized. A multitude of laws, regulations and enactments are in existence but are not generally enforced. The preventive measures comprise, (1) compulsory notification ; (2) the regulation of surface water ; (3) certain adaptations of dwellings and of dwellers ; and (4) the State issue of quinine. (1) It is lamented by the writer that compulsory notification is, like many of the other excellent proposals, largely not enforced. Presumably it proves as unsatisfactory in Italy as KORTEWEG is sure it will prove in Holland. (2) This includes the Italian principle of bonification, which may be used to compel an owner to improve, or lose, his land. (3) Screening and even the making of roads are included under this head. (4) To avoid adulteration and profiteering the State undertakes this paternal duty, but makes the contractor or factory owner buy and distribute it, under penalty of paying compensation to employees in case of death. ASCOLI is quoted as advising 1 to 1·5 gm. of quinine daily in treatment, less being useless and more only required in grave cases ; as stating that it must be so given as to be present in the blood when sporulation occurs ; and most amazingly as claiming that relapse may be caused by the parthenogensis of microgametes which, yet more unexpectedly, produce sexual cycles. There is noted the unhappy dilemma of the army pensioner faced with malaria and pension, or cure and no pension; and the remarkable results claimed for the railways by antimalarial measures. Many compulsory measures are, in fact, carried out by persuasion through voluntary societies, such as the Red Cross, with State aid. The net result has been a fall in the deaths caused by malaria, from 70 per 100,000 in 1887 to 7 per 100,000 in 1914.

C. L.

GRASSI (B.). **Reviviscenza temporanea della malaria in Toscana.**—*Ann. d' Igiene.* 1924. Feb. Vol. 34. No. 2. pp. 81–91.

The condition defined as paludism and anopheles without malaria existed in this part of Tuscany up to 1918. After that, spread was definite, so that in January 1922 there were 117 cases recorded. The experiences of the people led to their ready acceptance of quinine prophylaxis and treatment in 1922 and 1923. The maximum incidence in the latter year was 44 cases in May, yet there were but 2 cases in November and none in December. It is advised that these antimalarial measures should be continued.

C. L.

CHRISTIE (Ethel M.). **An Account of the Malaria Work done in Buzuluk Ooyezd by the Society of Friends.**—*Jl. Trop. Med. & Hyg.* 1924. July 1. Vol. 27. No. 13. pp. 187–190. With 1 chart.

The general position and routine at this malaria clinic have been dealt with by MACKENZIE (this *Bulletin*, Vol. 21, p. 291). Although *Anopheles maculipennis*, identified by ALCOCK, was caught in houses in winter, Christie does not state, as MACKENZIE did, that they bred during the winter in waterbutts indoors. 91,000 persons treated, all after microscopic diagnosis, each with 15 gm. of quinine, with a relapse rate of between 5 and 10 per cent., is a proud record.

C. L.

SOUTHERN MEDICAL JOURNAL. 1924. Aug. Vol. 17. No. 8. pp. 573–608.—**Symposium on Malaria.**

WELCH notes the spectacular fall in malaria following the initiation of control work in Alabama, and the hope of its speedy extermination which followed. There now come the discouraging discovery that nothing of the kind has ensued, and the realization of the disconcerting magnitude of the subject and the courage and enthusiasm needful for the remaining work.

CARTER advises that impounded water in ponds with gently sloping sides should be held at as high a level as possible while *A. quadrimaculatus* is not ovipositing, thus killing land vegetation and collecting floatage along the edges of the water. Just prior to the first flight of mosquitoes the pond's surface should be lowered as far as possible, thus stranding the floatage and larvae, killing the latter and leaving a clean water's edge open for the attentions of gambusia. Thereafter hold every rise of water during the summer as long as possible (but less than two weeks, the ovum to imago period), and then let it run down to clean edges.

Fricks writing on instances of abundant anopheles, sufficient human carriers, and no malarial problem, urges investigation of the unknown factors.

Barber & Mayne show that in the Southern United States benign tertian malaria reaches its maximum in spring and subtertian in late summer; and that negroes show, all the year round, a larger percentage of the latter than do whites.

Barber considers the spleen index in malaria in Lee County, Georgia. Of 338 negro children having no palpable spleen, 11·2 per cent. had plasmodia in the cutaneous blood, of 51 where it was felt on inspiration 35·3 per cent., of 126 where it was just palpable 34·1 per cent., of 29 where it came down 1 finger's breadth 55·1, of 3 where it came down 2 fingers' 60, of 23 with 3 fingers' breadths exposed 69·5. "The spleen index appears to afford a very sensitive, accurate and easily applied method of detecting present or recently acquired malaria." The experience of Eastern workers is—had to be—confirmed, but their methods are held to be too coarse to detect the finer degrees of enlargement to be found in such regions as the Southern United States. Christophers' work (this *Bulletin*, Vol. 21, p. 597) has evidently not reached America.

King showed that while in Louisiana a large mosquito population was required to produce a high malaria rate in man, yet an increase in the mosquito population was coincident with a fall in their percentage of infection. For instance, with two to five hundred mosquitoes per house 6 to 8 per cent. contained human blood; with 1,500, 3 per cent. or less.

O'Connor instanced an animal house placed between breeding pond and human residence, containing calves and acting as an interceptor of *A. quadrimaculatus*; and pointed out the extent to which these harbour in hollow trees.

Le Prince showed that major drainage operations do not necessarily reduce the prevalence of malaria.

C. L.

Maxcy (Kenneth F.). **Epidemiological Principles affecting the Distribution of Malaria in Southern United States.**—*Public Health Rep.* 1924. May 16. Vol. 39. No. 20. pp. 1113-1127. [20 refs.]

Malarial foci are *endemic* when conditions favourable for transmission are present continuously year after year; *potential* where they may be realized at any time, although one or other factor is, for the time being, absent; *epidemic* when some new condition has facilitated transmission in an endemic, or made it possible in a potential, focus. The disease is not ubiquitous in the Southern States, and efforts to control it should be directed towards endemic foci.

C. L.

Barber (M. A.). **Malaria in the Seventh District of Louisiana.**—*New Orleans Med. & Surg. Jl.* 1924. July. Vol. 77. No. 1. pp. 16–19.

The ground is that covered by Maxcy (this *Bulletin*, Vol. 20, p. 963). The parasite rate, based on a single examination of a thick film, was

3·2 (in negro children 4, and in white children 1·5). Negroes are less incommoded, less likely to undergo treatment, and so a greater danger to the community than whites. It is pointed out that with sufficient anopheline and human carriers, a susceptible population, and suitable meteorological conditions, there yet occur portions of local rice-growing regions where the malaria rate is low and apparently falling. The standard of living is emphasized as an antimalarial factor, a useful reminder of a phenomenon of which modern Algeria is perhaps one of the most striking examples.

C. L.

DOWLING (Oscar). **Malarial Infection in the Lower Mississippi Valley.**—*Amer. Jl. Trop. Med.* 1924. Sept. Vol. 4. No. 5. pp. 461–468.

The facts disclosed are mainly those collected by MAXCY (this *Bulletin*, Vol. 20, p. 963). "Theoretically, it is extremely easy to prevent the spread of malaria and the eradication of the breeding places of the Anopheles; practically it is very difficult." There is noted the growing realization by railway companies of the commercial possibilities of eradicating malaria, as exemplified, to take a single instance, in the damage to expensive machinery by incompetent substitutes for skilled men sick of malaria. For the population generally, education and willingness for effort must precede effective antimalarial measures.

C. L.

BONNE (C.). **Malaria in Suriname.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 2. Vol. 68. 2nd Half. No. 5. pp. 616-637. With 1 fig. [4 refs.]

Dutch Guiana consists typically of a flat marshy coastal strip, a sandy savanna-land, and a hilly interior more malarial than the rest of the country and containing the mines. All three species of malaria parasites are present and ten known species of Anopheles. In the hills subtertian malaria is the commonest form, and the main insect host is *A. argyritarsis*. This mosquito is not found on the coast, where *A. tarsimaculatus* is implicated. It is estimated that of bush-nigger children 54 and of adults 24 per cent. are infected. Black miners have 56 per cent. infected, a condition suggesting tolerance among those living in the bush. *A. tarsimaculatus* differs anatomically on the coast and at Moengo in that the second hind tarsal is on the coast half white, and at Moengo three quarters to four-fifths white. In July the anopheline population is at its highest. A month's treatment of half a gramme of quinine was undertaken for Javanese with enlarged spleens. All kinds of malaria were far less prevalent in 1922 than in 1921. Ten cases of blackwater fever occurred in these years.

C. L.

MEDINA JIMÉNEZ (Rafael). **Nuevos datos demostrativos de la gravedad de la endemia malarica en el interior de Venezuela.** [Grave Endemic Malaria in Venezuela.]—*Rev. Med. y Cirug.* Caracas. 1924. Jan. 31. Year 7. Month 3. No. 70. pp. 74–79. [1 ref.]

The town of Camatagua, situated on the Guarico where it leaves the hills for the plains, had formerly a population of six or seven thousand. It now possesses one of 800, more or less, who suffer from malaria, ankylostomiasis, dysentery, buboes and bilious haemoglobinuric fever.

The spleen index is 73, while those who show either enlarged spleen, malaria parasites, mononucleosis, or pigmented leucocytes number 94·8 per cent. of the whole.

C. L.

MARTINI (E.). **Ueber Malariaindizes.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Oct. Vol. 28. No. 10. pp. 419–428. With 1 fig.

In 131 children examined the spleen was enlarged in 12, and parasites present in 65, six having both palpable spleens and parasites in the cutaneous blood. The absolute infection was then 71 in 131, or 54 per cent. Martini apparently holds that the probable total index in such a case should be worked out thus :—

$$\frac{\text{Number of enlarged spleens} \times \text{Number of positive bloods} \times 100}{\text{Number of enlarged spleens with positive blood} \times \text{Total}}$$

$$\text{in this case } \frac{12 \times 65 \times 100}{6 \times 131} = 99.$$

C. L.

GILKS (J. L.). **Some Notes on Malaria.**—*Kenya Med. Jl.* 1924. June. Vol. 1. No. 3. pp. 66–74. With 8 charts.

In Kenya subtertian malaria is the commonest and quartan the rarest form. The proportion of tertian to subtertian malaria was from 1907 to 1914, 1 to 9·9 ; from 1915 to 1918, 1 to 2·4 ; from 1919 to 1923, 1 to 5·7. The alteration during war time is attributed to a presumed importation of benign tertian carriers with the Indian Expeditionary Force.

C. L.

SEYFARTH (C.). **Der Malariatod.** [Death in Malaria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. pp. 289–294. [8 refs.]

In acute malaria a wide experience, personal and of the literature, places the cause of death in seven categories :—(1) Septicaemic, a massing of infected erythrocytes in blood-vessels of all vital organs, 30 per cent. (2) Cerebral, 50 per cent. (3) Cardiac, 14 per cent. (4) Renal, 1 per cent. (5) Suprarenal. (6) Pancreatic. (7) Rupture of the spleen. Chronic malaria is a disease of complications, causing death by bronchopneumonia, dysentery and septicaemia, quite apart from its combinations with typhus, typhoid, influenza, tuberculosis, ankylostomiasis and kala azar.

C. L.

BUSINCO (A.) & FOLTZ (P.). **Contributo anatomo-patologico alla patogenesi delle epato-splenomegalie malariche (con particolare riguardo al contegno delle "Gitterfasern").**—*Policlinico.* Sez. Med. 1924. Sept. 1. Vol. 31. No. 9. pp. 474–496. With 7 text figs. [28 refs.]

Trellis fibres result from the irritation of malarial infection. In the liver they are associated with hyperplasia of the lobule. They are apt to take the form of circumcapillary fibres radiating, or encircling the vessels, and, after a certain number of attacks, likely to form a network. In the spleen the change takes place in all parts. It is best shown by impregnation with silver.

C. L.

STEPHENS (J. W. W.) & GORDON (R. M.). **The Crescent and the Red Cell.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 207–210. With 4 plates. [4 refs.]

That, as shown by LAWSON (this *Bulletin*, Vol. 15, p. 419, etc.), there is not one stereotyped appearance of crescent and red cell is emphasized by a series of 48 drawings.

"We may state at once that we consider that the specimens show clearly that in many cases the poles of the crescent project beyond the red cell, but we have been unable to determine the relationship of the body of the crescent to the red cell, although the general impression left on our minds after examining a very large number of crescents during the last three months is that the body also is extracellular."

C. L.

MAGGIORE (Salvatore). **Nefropatie malariche nell' infanzia.**—*Pediatria.* 1924. Nov. 1. Vol. 32. No. 21. pp. 1257–1264. [5 refs.]

Work undertaken in connexion with the University of Palermo showed that of 130 children, 68 having subtertian, 37 tertian and 25 quartan malaria, 23·8 per cent. had albuminuria, casts, haematuria or pyuria. Of these albumin was the commonest; haematuria was associated with haemophilia. Very young children are said to get an acute interstitial malarial nephritis, in general curable by quinine. No chronic or relapsing cases were studied. Excessive parasitism and excessive stagnation of parasites in the kidneys are held to occur at that age, and to explain the matter.

C. L.

SINTON (J. A.) & LAL (R. B.). **The Incidence of Albuminuria in Malaria, with a Note on its Occurrence during Quinine and Alkali Treatment.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 47–63. With 1 chart. [37 refs.].

A valuable summary of the recorded occurrence of albuminuria in unclassified malaria shows that it varies from 0 in CHAMBERLAIN'S findings to 97·5 per cent. in those of MARCHOUX. The suggested causes of this variation are (*a*) a selected population—such as that of a hospital to which only grave cases would be admitted, or a jail containing men only; (*b*) the dosage and mode of administration of quinine—since the drug, especially in large doses and with intramuscular injection, seems capable of causing albuminuria; (*c*) the number of days on which the urine is examined—a detail which does in fact make a considerable difference to the percentage revealed; (*d*) the diet—since an alkaline reaction of the urine has been found to protect against experimental nephritis; (*e*) climate—which induces sweating and scanty and concentrated urine; (*f*) the normal incidence of albuminuria—which does not seem to have been determined in these cases. It is pointed out that all these factors require more attention than they have hitherto received. The effect of Sinton's quinine and alkali mixture (this *Bulletin*, Vol. 20. pp. 300 & 971) in producing albuminuria was tested in 236 cases, 231 controls receiving quinine without alkali. There were 33 cases of albuminuria in those receiving alkali, and 31 in those who did not.

C. L.

GORDON (R. M.). **The Value of Urinary Examinations in the Diagnosis of Malaria.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 351–362. [15 refs.]

In this considerable series of cases there are tabulated almost daily variations in the temperature, malaria parasites, urobilinogen, urobilin, albumin, casts, indican, bile pigments, and urea of over 3 per cent. The urinary reagents and tests are described in detail. No differences in the urinary constituents were detected for the different species of malaria parasites. The most detailed tests concerned three cases of general paralysis infected in England with *P. vivax* by the deliberate bites of infected mosquitoes. Urobilin or urobilinogen appeared before, with, and after the parasites, and persisted for 1 to 5 days after the blood became negative. Albumin and casts appeared within 3 days of the first finding of parasites in the two cases in which they had formerly been absent; in the third, in which they were present before infection, the effect of quinine treatment was that casts disappeared before parasites, and albumin soon after. Urobilinogen, urobilin and indican frequently appeared in a febrile case of lymphadenoma used as a control. Taking into consideration normal persons, mixed hospital cases, cases of clinical and cases of microscopically established malaria, it is concluded that, regarding positive findings, no single test has proved diagnostically unassailable, all the phenomena occurring with considerable frequency even in normal persons; but a combination of urobilin and albumin is shown by the three inoculated cases to be strongly suggestive of malaria.

As regards negative evidence, absent urobilin indicates absent urobilinogen, but not *vice versa,* and suggests absence of malaria since urobilin is present in 87 per cent. of malaria cases. [It is surely very desirable that these tests should be repeated, not on these initial cases in which quinine has so recently been shown to exercise such rapid and complete disinfestation, but in those difficult cases in which, with no quinine taken and with careful blood examination made, parasites are not found in the peripheral blood, although their subsequent appearance under conditions reasonably excluding infection shows that parasites have been present throughout.]

C. L.

KORTEWEG (P. C.). **Malaria in het ontwerp van wet houdende voorzieningen tegen besmettelijke ziekten.** [Malaria in the Draft Law containing Provision against Infectious Diseases.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Mar. 22. Year 68. 1st Half. No. 12. pp. 1322–1324.

The Secretary of the Malaria Commission of North Holland points out that no diseases are mentioned in the Draft; yet it appears from an explanatory memoir that malaria is to be included, in which case it will be obligatory on every physician to report within 24 hours every case which he suspects of being malarial. So convinced, indeed, is the Minister of the efficacy of this procedure that in explanatory instructions he quotes malaria as an instance of failure to check at the beginning an expensive epidemic. As long ago as 1901, it is pointed out by Korteweg, it was shown that malaria in Holland rarely had the classical form and that history here repeats herself, that the causes of the lighting up of Dutch malaria are unknown, that primary and relapse cases exist, and that if malaria be included in the Schedule, full wastepaper baskets may be looked forward to with confidence.

C. L.

SWELLENGREBEL (N. H.). **Le paludisme aux Pays-Bas.**—22 pp. With 6 charts.

Equally with KORTEWEG (see above) Swellengrebel considers valueless the compulsory notification of malaria in Holland. Much of the matter dealt with has already been considered in the reviews of the Annual Reports of the Malaria Commission of North Holland (Vol. 20, p. 962). Points needing special emphasis are the great excess of *A. maculipennis* in Holland compared to the numbers of anopheles to be found in the tropics coupled with the restriction of malaria centres. There have been caught three times as many anopheles in animal houses as in dwellings, but 52 per cent. of the last contained blood; and it is concluded that *A. maculipennis* is really zoophil in Holland, but that there are too many of them to feed comfortably on the available beasts, so many fall back on man. A vivid description of the hydraulic conditions obtaining in Holland is given.

C. L.

VICKERS (V. C. W.). **Chronic or Suppressed Malaria.**—*S. African Med. Rec.* 1924. Sept. 13. Vol. 22. No. 17. pp. 404–405.

It is admitted that in the conditions of debility and slackness described the proof that the cases are malarial is difficult in the extreme, but the reaction to quinine is held to be striking and to demand adequate anti-malarial screening and treatment of white men, the educative effect to lead on to the proper disinfestation of native cases.

C. L.

SEYFARTH (C.). **Malariaparasiten und Malariapigmentbefunde in der Leiche.** [Malaria Parasites and Pigment in the Dead Body.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 8. pp. 351–358. [7 refs.]

These investigations lead to the conclusion that in the stagnant blood of a corpse, provided it be warm, development goes on to schizogony, but that, contrary to the opinion of GASKELL and MILLAR, the merozoits do not penetrate fresh corpuscles. Examinations of sections are held to show that in fever-free periods infected corpuscles lie within the capillary lumen, but against the capillary wall, of internal organs, uninfected corpuscles occupying the capillary axis. Degenerating forms lie within macrophages. Pigment lies free in the plasma, in leucocytes, in endothelial cells, never in parenchyma cells, It may be found two years after the last malarial attack.

C. L.

HOLM (Kurt). **Ueber einen Fall von Infektion mit Malaria tropica an der Leiche.** [Subtertian Malaria acquired from a Corpse.]—*Klin. Woch.* 1924. Sept. 2. Vol. 3. No. 36. pp. 1633–1634. [1 ref.]

The acquisition of subtertian malaria from a corpse is here suspected. B. had malaria held, clinically and microscopically, to be tertian, but apparently suspicion was raised by later developments, and on subsequent re-examination of the film a crescent was found by Professor HEGLER. B.'s blood was injected into H., a patient with general paralysis, who died after an unstated interval with unstated symptoms. Autopsy on H. was performed by J. on 13th February, at Hamburg, the interval after death being unstated. H.'s brain showed appearances held indicative of subtertian malaria. While sewing up the body, J. pricked his finger. Fifteen days after the autopsy J. fell ill with rigors and fever, and nine days later every second or third erythrocyte contained one, two or three plasmodia identified as those of subtertian malaria. He still had a scab on the pricked finger. It is held that transference by a mosquito is impossible in winter in Hamburg, and that this is accordingly the first recorded instance of infection from a dead body.

C. L.

BEYERMAN (W.). **Chorea veroorzaakt door malariaintoxicatie.** [Chorea caused by Malaria.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Oct. 18. Vol. 68. 2nd Half. No. 16. pp. 1987–1988.

A boy of 17, youngest of a family of 17, of whom 10 had died in childhood and three had suffered from chorea, developed in March in Holland choreiform movement coming on at 9 in the morning, lasting all day and night, and ending next morning when he fell into a deep sleep. The cycle was repeated every other day for four months. At that time he had fever, enlarged spleen and malarial parasites, presumably tertian, in the blood. Under quinine the malaria and choreic movements disappeared.

C. L.

DEIRE (Ladislaus). **Der plötzliche Tod eines mit Neosalvarsan behandelten Malariakranken unter Addisonschen Symptomen.** [Sudden Death with Addisonian Symptoms of a Malaria Patient treated with Neosalvarsan.] —*Med. Klin.* 1924. July 20 Vol. 20. No. 29. pp. 1001-1002. [17 refs.]

A tertian malaria microscopically established, with fever reaching 40° C., diarrhoea, vomiting, jaundice, weakness, fainting, urobilinuria, optic neuritis. His blood was not freed from parasites by unstated doses of quinine. Neosalvarsan 0·15 gm. produced a rigor; 0·3 gm. a second rigor, collapse and death. At autopsy the adrenals were enlarged and congested.

C. L.

FREIRE (L. de Castro). **Malaria congénitale.**—*C. R. Soc. Biol.* 1924. June 27. Vol. 91. No. 22. pp. 219–220. [1 ref.]

That the disease was malaria rests upon physical signs and upon the presence in the blood of gametes which the writer felt he could not with certainty identify; that it was congenital on the statement that the mother, whose blood was not examined, had attacks clinically resembling malaria, that there are no anopheles in Lisbon, and that the child was born and lived there till seen by the writer when seven weeks old.

C. L.

JAGDSCHAN. **Ein Fall von angeborener malaria tropica.** [A Case of Congenital Malaria Tropica.]—*Russian Jl. Trop. Med.* Moscow. 1924. No. 3. In Russian. p. 15. With German summary.

Subtertian rings, scanty schizonts and crescents were obtained from both maternal and foetal sides of the placenta; and subtertian rings and crescents in smears of the child's blood taken immediately after birth, although, curiously enough, nothing was found in thick films. "Thus we have an undoubted case of congenital malaria."*

C. L.

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*From an abstract furnished by Mr. C. A. HOARE.

OLIVELLI (E.). **Contributo clinico alla questione della malaria congenita.**—*Pediatria.* 1924. Aug. 15. Vol. 32. No. 16. pp. 957–964. [22 refs.]

Olivelli points out that most so-called cases of congenital malaria are vitiated because parasites have been found at an interval after birth which does not exclude post-natal infection in malarious countries.

In this case the mother was infected in Sardinia, two years before the child's birth in Genoa. Genoa and its hinterland, the only places in which the child lived, are held free from malaria. A wet nurse was provided for the child from the age of five days, since a presumed attack of malaria in the mother deprived the child of nourishment at that age. Whether the infected child was still with the mother after this is not clear. Malarial parasites were first found in the child's blood five months after birth.

C. L.

WELCH (H. V.). **The Administration of Quinine during Pregnancy.**—*Kenya Med. Jl.* 1924. July. Vol. 1. No. 4. pp. 124–127. [4 refs.]

A woman three months pregnant took in error 50 grains of quinine; another pregnant woman took deliberately 100 grains on three successive days, with sharp haematuria; both went to term. On the other hand, Welch has notes of many abortions which he holds caused by malaria, and which he attributes tentatively to thrombosis of the cord. Malaria occurring in a child of three days old is mentioned, without details.

C. L.

ARNELL (H. M.). **Administration of Quinine during Pregnancy.** [Correspondence.]—*Kenya Med. Jl.* 1924. Sept. Vol. 1. No. 6. p. 189.

Having known of English working women regularly producing abortion about the third month by massive doses of quinine (although in others only toxic symptoms were produced), and quoting German authorities as stating that labour can be produced at term in 25 per cent. of cases by castor oil and three 10-gramme doses of quinine, Arnell instances two women at about eight months who were delivered of living children shortly after administration of quinine for malaria. The first was a mild case of fever, delivery occurring four days after beginning quinine acetyl salicylate, 5 grains three times daily; the second a severe one over ten days, with vomiting and epistaxis over three. She had two 20-grain injections of quinine bihydrochloride intravenously within four hours and miscarried two hours after the second one.

C. L.

BARBIER (P. L.). **Quelques réflexions au sujet du paludisme.—Palper de la rate.—Injections intra-musculaires de quinine.**—*Arch. Méd. et Pharm. Milit.* 1924. May. Vol. 80. No. 5. pp. 462–464.

The spleen is palpated with the patient lying half way between the dorsal and lateral decubitus. Injection is by quinine urethane 2 or 3 cc., and camphorated oil 2 cc. One needle is used for filling the syringe, and another, whose point runs no risk of injury and whose outer surface is kept free from quinine solution, for injecting. Several hundred injections have been given thus without accident.

C. L.

MOCHKOVSKI (Ch.). **Les principes du traitement quinique du paludisme.** —*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 310–322. With 2 figs. [10 refs.]

It is well known that the therapeutic effect of quinine depends, above all, on the moment of administration. Accordingly its action on parasites of different ages differs. Let it be admitted that it is the young merozoit which is susceptible. This is not present in the blood at one time only, though it is preponderatingly so at the time of fever. There must then be a constant arrival of quinine in order to kill the parasite at its susceptible time and in a form insuring certain and prompt action. If given by mouth, the dosage advised is 0·2 gm. every 3 hours, or 0·25 gm. every 4 hours; if by hypodermic injection, which is evidently held not to produce necrosis, seven injections (dose unstated) at eight-hourly intervals; if by intramuscular injections, 9 to 13 injections of 0·3 to 0·2 gm. every 6 or 4 hours; if intravenously, as frequent injections as possible over 54 hours. These doses are held to maintain a sufficiently high quinine content in the blood throughout the asexual cycle. [For the premisses and conclusions of this quite logical paper no proof is offered, nor has the reviewer been able to find any in the literature (this *Bulletin*, Vol. 21, p. 853).]

C. L.

STRADOMSKY (Boris). [**Die Ergebnisse der Malariabehandlung nach verschiedenen Methoden.**]—*Süd-Ostischer Bote der Gesundheitsfürsorge.* 1923. No. 12. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 8. pp. 358–360. By the writer.]

Intravenous quinine in tertian malaria gave 12 per cent. of relapses after 30 days, 82 per cent. after 300 days. After an autumn injection relapse followed on the average in 170, after a spring injection in 10·8 days. Oral quinine gave the same results, whether or not combined with neosalvarsan or methylene blue. Subtertian was the least, quartan the most stubborn. To stop the next attack of tertian fever due, 1·28 gm. of quinine sufficed intravenously, 2·32 gm. orally. Oral quinine is held effective by duration, not by size, of dosage, 1 or 2 gms. on 2 or 3 consecutive days, every 10 days, are advised. The usual urgent indications for intravenous quinine are noted, and the intramuscular route conceded if the skill to enter a vein be absent.

C. L.

COMENGE GERPE (Rafael). **Radioactividad de la quinina, su mecanismo antipalúdico.** [The Radio-Activity of Quinine, its Antimalarial Action.]—*Siglo Med.* 1924. Apr. 26 & May 3. Year 71. Vol. 73. Nos. 3672 & 3673. pp. 411–414. With 4 text figs. pp. 440–444. [15 refs.]

It is concluded that quinine is radio-active, and accordingly first excites and then destroys cellular activity, particularly its germinative power, a consideration permitting a glimpse of its mode of action upon plasmodia; that it is much more radio-active when dehydrated; and that its combination with radium and X-rays merits investigation.

C. L.

VALENTI (F.) & TOMASELLI (A.). **Lo stovarsolo nella cura della malaria. Nota preventiva.** [Stovarsol in the Treatment of Malaria, a Preliminary Note.]—*Policlinico.* Sez. Prat. 1924. Sept. 8. Vol. 31. No. 36. pp. 1159–1160.

Stovarsol, a proprietary drug, is the acid acetyl-amino-oxyphenyl of arsenic. It was given to two cases. The first was a heavy quartan infection which had resisted quinine. One lozenge was given on the first day, and two daily for another ten days. Parasites disappeared and the spleen, which has reached the umbilicus, shrank. The second case was infected with *P. vivax* and received the same treatment for five days, with rapid clearance of the blood and reduction of the spleen, which also had reached the umbilicus. The period of subsequent observation is unnoted.

C. L.

JONES (W. E.) & BUTLER (H. W.). **A Trial of** ***Vitex peduncularis*** **in Malaria.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp. 387–391.

In two cases of tertian and two of subtertian malaria in which no other treatment was given fluid extract of leaves of *Vitex peduncularis* was administered, the blood being checked by microscopic examination twice daily. In no case did improvement follow, and in every instance quinine had to be administered—with rapid disappearance of symptoms and parasites. [*Cf.* this *Bulletin,* Vol. 21, p. 857.]

C. L.

LOMBARDI (Alfredo). **L'opoterapia cerebrale nella cura dei malarici epilettici.** [Cerebral Opotherapy in the Treatment of Epilepsy with Malaria.]—*Terapia.* 1924. Aug. Vol. 14. No. 62. pp. 239–242.

It is concluded from the experience of five cases that 1 cc. of brain extract, injected or taken by mouth, will permit of the administration of quinine to epileptics which, without it, would throw them into fits; and that its hypodermic injection permits the treatment of epilepsy in one with pre-existing gastro-intestinal disturbances which do not tolerate such drugs as bromide.

C. L.

YORKE (Warrington) & MACFIE (J. W. S.). **Observations on Malaria made during Treatment of General Paralysis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 13–33. [33 refs.] (Discussion pp. 33–44.)

—— & ——. **Certain Observations on Malaria made during Treatment of General Paralysis.** [Abstract.]—*Lancet.* 1924. May 17. pp. 1017–1019.

The following abstract of this paper and discussion will, perhaps, suffice for those unfortunates who lack opportunity or inclination to read the original. Four cases were subcutaneously inoculated with quartan malaria; the induced fever was irregular, quotidian throughout or quartan becoming quotidian. Treatment was by the daily oral administration of 30 grs. of quinine for 2 months. Parasites took 4 to 7 days to disappear from the cutaneous blood, and no relapse occurred within the observation period of 3 to 5 months. Another case similarly inoculated and failing to show malaria was on the 39th day bitten by a mosquito having tertian malaria. *Plasmodium malariae* proclaimed its presence by a rigor on the 44th day, and *P. vivax* on the 54th. In a sixth inoculation case with *P. malariae* the incubation period was 54 days, and two relapses occurred after treatment. Malignant tertian malaria was injected once with a fulminating fatal illness.

Tertian malaria has been carried over both by direct subcutaneous inoculation and by mosquitoes.

The direct inoculations comprise 70 cases in 23 direct passages initiated from a strain contracted in India, an old-standing relapse case previously treated with quinine on many occasions, and 28 other cases from differing strain. At the first inoculation 9 failed to acquire infection, apparent evidence of some natural immunity, although 4 out of 5 tested acquired malaria at a subsequent inoculation. Spontaneous cure occurred in 4 cases, 3 of which had successfully been inoculated with and cured of malaria 6 to 12 months earlier, presumed evidence of an acquired immunity. Treatment was in 61 cases by 30 grains of quinine sulphate in solution on each of 3 consecutive days, or 6 gms, in all. Over an observation period of 4 to 18 months, very rarely 2 to 4 months, one or 1·6 per cent. relapsed. Prophylactic quinine in daily dose of the sulphate for 14 or 7 days, with the inoculation in the middle of this period, showed no infection over periods between 5 weeks and 4 months.

Mosquito infections were as readily induced in 41 cases with *A. bifurcatus* as with *A. maculipennis*, both reared from larvae collected in Cheshire. Their infection in the same feeding batch was approximately constant, and related to the number of gametocytes found in the peripheral blood at the time of feeding. They displayed a sporozoit septicaemia (this *Bulletin*, Vol. 18, p. 103). Infection invariably followed feeding, no immunity being displayed. The first form to be found in the blood was nearly always the more numerous trophozoit, but the rarer gametocyte was never more than 2 or 3 days behind it. Treatment in 2 cases was by novarsenobillon, 0·6 to 0·9 gm. Both relapsed. Thirty-nine cases were treated with 6 gms. of quinine sulphate as above. Six died soon after treatment without parasites in the blood, two about a month after treatment without relapse. Of the 31 survivors 4 (13 per cent.) relapsed. Regarding prophylaxis, it is concluded that quinine given before the infective feed is useless, although in the table giving details there is no instance in which quinine was administered during this period only. Infection, however, occurred unless quinine sulphate in doses of 5 grains daily or more were taken for 10 to 14 days after the feed, the conclusion being that its action on sporozoits is negligible. The observations, the writers note, show the unicity hypothesis as untenable, seeing that neither in morphology, relation of sexual to non-sexual forms, incubation period nor clinical symptoms does the strain undergo, if a sufficiently long period be observed, any change. Full confirmation is obtained of the continental observations, that induced malaria is very susceptible to treatment. This susceptibility cannot be due (1) to an undue sensitiveness of an inoculation strain to quinine, since the mosquito cases reacted well, though not so well; (2) to the strain having been hitherto quinine-innocent, for the original donor had suffered much quinine with many relapses; (3) to previous syphilis, since two non-syphilitic cases of dementia praecox reacted equally readily to the 6gm. treatment; (4) to the absence of a quinine-resisting strain due to reproduction in quinine-surviving individuals, since there is no evidence that quinine reaches all individuals and since the writers have found that in no case did parasites persist in the cutaneous blood after it had been made certain that quinine reached the blood, as, for instance, after an injection; (5) to the particular line of treatment, since similar success has been obtained by others with other lines.

It is held to be at least a reasonable assumption that no form of quinine therapy ever destroys all malaria parasites in the human body, that cure results because quinine given to one whose blood contains many parasites destroys, directly or indirectly, a proportion of these, thus setting free soluble antigen which, inducing production of antibody, sterilizes the host. The evidence offered regarding the first proposition is that quinine is more efficacious when parasites are many than when they are few; regarding the second, that there is no constant relationship between the number of parasites injected and the length of the incubation period, that certain cases refused to become infected, that spontaneous cures resulted, and that similar cures result in infection with *Plasmodium relictum.* Resistance is accordingly to be looked upon as immune body resistance, not quinine resistance. In this connection JAMES suggested in discussion that the failure of parasites to develop is a result of under-nourishment in the host and not of immunity. [One might, perhaps, illustrate this suggestion by noting that fresh water is immune from mackerel, not because fresh water contains bodies inimical (or anti-) to them, but because it does not contain bodies essential for their existence.]

Regarding the mental effects of malarial infection, 23·8 per cent. were unchanged but alive, which would not otherwise have been the case for the majority; in 11·9 per cent. there was physical improvement; in 20·2 per cent. great physical and distinct mental improvement; in 27·4 per cent. physical and mental improvement justified discharge, a number returning to their old occupations. None suffering from general paralysis had previously been discharged from these hospitals.

JAMES, LOW and HANSCHELL stressed the point that the high temperatures of 105° or 106°, essential, probably through protein shock, for good mental effect, involved considerable risk and necessitated great care and watchfulness, the two last emphasizing evidence suggesting that quinine fails to act on sporozoits. Andrew BALFOUR urged the need of great assistance from the bio-chemist in elucidating the action of quinine, and suggested the investigation of antigens from cultured parasites as an aid to quinine.

C. L.

MACBRIDE (Henry J.) & TEMPLETON (W. L.). **The Treatment of General Paralysis of the Insane by Malaria.**—*Proc. Roy. Soc. Med.* (Section of Psychiatry). 1924. June. Vol. 17. No. 8. pp. 15–24. [15 refs.] (Discussion pp. 25–26.)

Malarial, apparently benign tertian, blood was injected, generally intravenously, into 18 cases, with a syringe lubricated with liquid paraffin to prevent clotting. Irregular fever began on the second or third day, became tertian a few days later, and in some instances became quotidian after 12 to 16 days. Usually 12 high fever reactions were permitted, a tertian rhythm being preferred as less prostrating than a quotidian. The writers are of opinion that the virulence tends to increase with each transmission, the maximum number of direct transmissions being in their cases ten, and they advise that the strain should be renewed at each opportunity. Three cases died during the fever; in two, post-mortem examination was made and showed marked splenic enlargement with bile staining of the liver. Several cases refused to develop fever, all of them having previously suffered from natural malaria. The paper contains no suggestion that in any infected person search was made for parasites either during life or after death.

C. L.

GRANT (A. R.) & SILVERSTON (J. D.). **Malaria Therapy in General Paralysis: being Observations on Fifty Cases treated at the County Mental Hospital, Whittingham.**—*Jl. Mental Science.* 1924. Jan. Vol. 70. No. 228. pp. 81–89. [4 refs.]

These cases were all injected subcutaneously, mostly with 2 to 3 cc. of blood containing *P. vivax*, and one case, successfully, with blood which had been citrated and kept at body temperature for 5 hours. Of over 50 cases 2 failed to become infected at the first injection, but inoculation 4 or 5 weeks later was successful in all; as was re-inoculation after cure of a first course of malaria. Treatment of malaria was by oral administration of 30 grains of quinine sulphate for 3 days, neo-salvarsan also being given weekly for 6 weeks. Blood films were examined daily for 3 months. One case relapsed. Mental recovery followed in early cases.

C. L.

TEMPLETON (W. L.). **The Effect of Malarial Fever upon Dementia Praecox Subjects.**—*Jl. Mental Science.* 1924. Jan. Vol. 70. No. 288. pp. 92–96. [10 refs.]

It was confirmed that leucopenia is the rule in malaria. There was no cross inoculation from syphilitic to dementia praecox patients, the source of the original infection, which was presumably with *P. vivax*, not being indicated. Intravenous infection was carried out and daily rigors were the rule. Treatment was by 10 grains of quinine sulphate for three doses, and then 5 grains daily for a week. One case relapsed, presumably clinically, but he had only had 10 grains of quinine. It is not stated that blood examinations were made. Anaemia was profound and rapidly recovered from. Temporary, but little or no permanent, mental improvement followed.

C. L.

RUDOLF (G. de M.). **The Temperature-Chart in artificially inoculated Malaria.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 1. Vol. 27. No. 19. pp. 259–263. With 7 charts. [3 refs.]

Blood containing *P. vivax* was used throughout. Onset of fever was sudden or gradual. Rhythm might be frankly tertian, or frankly quotidian, or each might change into the other. The temperature usually fell to normal between rigors, but has remained raised from 40 to 176 hours. The highest temperature reached was 106·8° F. "Paroxysms in the therapeutic disease tend to reach their height slightly later in the day than do those of the naturally-acquired infection," and are of shorter duration according to the periods given by GACCINI. Two strains were used and were held to differ in their pyrogenetic effects.

C. L.

PIJPER (Adrianus) & RUSSELL (Beth Dill). **Incubational Changes in the Red Cell Count in Inoculated Malaria. (Preliminary Note.)**—*Brit. Med. Jl.* 1924. Oct. 4. pp. 620–621. [1 ref.]

After subcutaneous injection of 0·5 to 10 cc. of blood containing *P. vivax* there occurred in the 9 cases concerned a rise of 10 to 30 per cent. in the number of red corpuscles, followed by a diminution. The rise is attributed to an increased formation of erythrocytes, the result of stimulation of the red marrow. "The outbreak of fever can always be prevented by an injection of neosalvarsan as soon as the increase in red cells is well established."

C. L.

KORTEWEG (P. C.). **De aanvangskoorts der malaria tertiana.** [The Initial Fever of Tertian Malaria.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Apr. 12. Year 68. 1st Half. No. 15. pp. 1622–1638. With 26 figs. [16 refs.]

Sixty-six general paralytics were inoculated intravenously in Amsterdam with 1 to 3 cc. of blood containing *P. vivax*, subtertian and quartan malaria being excluded. Probably only once did the injection fail to produce infection. In 52 cases parasites were first detected in a thick drop from the cutaneous blood on the following days: on day *5*, 2; *6*, 6; *7*, 7; *8*, 6; *9*, 8; *10*, 5; *11*, 3; *12*, 6; *13*, 2; *14*, 2; *16*, 2; *18*, 2; *21*, 2. Examination of cases were mostly made only on alternate days. The rectal temperature, taken 3-hourly, showed generally a preliminary rise during the first 3 to 5 days, commonly reaching 38°, sometimes 39° C. In the later and real malarial rise parasites, during high fever, varied in the cutaneous blood from 1 to 650 per thousand leucocytes. ROSS & THOMSON'S pyrogenic limit of 200 to 500 plasmodia per cc. of blood corresponds, it is pointed out, to from 30 to 70 per thousand leucocytes. They were, however, seen with extreme rarity while this febrile stage was beginning. The fever was frequently continuous, a condition held specific for primary malaria. It is pointed out that in the original Rome-London anopheline experiments the published chart shows first a continuous and then an intermittent fever, and that, since the thick drop method had not then been devised, the failure to find plasmodia until the fourth day of fever was only to be expected.

C. L.

i. KIRSCHNER (L.) & VAN LOON (F. H.). **Over malaria-behandeling van de dementia paralytica in de tropen, (tevens bijdrage tot de malaria-immuniteit).** [Malaria Treatment of General Paralysis in the Tropics (also a Contribution to Malaria Immunity).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 3. pp. 451–465. [38 refs.]

——— & ———. **Zur Malariabehandlung der progressiven Paralyse in den Tropen. (Zugleich ein Beitrag zur Malaria-Immunität.)**—*Klin. Woch.* 1924. Oct. 28. Vol. 3. No. 44. pp. 2001–2003. [2 refs.]

ii. VAN LOON (F. H.) & KIRSCHNER (L.). **Inoculation of Benign Tertian Malaria from Man on Man in Batavia.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1924. Part 3. pp. 271–281.

i. Parenchymatous syphilitic affections of the nervous system are rare in the tropics, anyhow among the native populations, although syphilis is widespread in tropical countries. Of the male population of lunatic asylums in the Dutch East Indies 9·1 per cent. of Europeans and 2·9 per cent. of Asiatics suffer from general paralysis. In syphilitic infections in the natives skin symptoms predominate ; probably the skin plays an important part in the formation of antibodies. On the other hand, it is possible that feverish diseases, so common in the tropics, influence the manifestations of syphilis. The authors treated 12 sufferers from general paralysis with artificial malarial infection. In 4 cases fully developed malaria resulted, the others (all living in the tropics since early childhood) either proved absolutely immune, or the fever was abortive. Of the 4 cases successfully infected, 1 Eurasian (treated with subtertian) showed a complete remission after the cure, 2 natives (treated with tertian) considerably improved.

W. J. Bais.

ii. The refractoriness to malaria of the patients here dealt with is striking. All had lived in the tropics since birth. Most appeared completely immune to four or five intravenous injections of 3 cc. of benign tertian blood withdrawn during fever. Spontaneous recovery was common; in only one out of 10 did 14 attacks occur without spontaneous disappearance of symptoms.

C. L.

Scherber (G.) & Albrecht (O.). **Die Wirkung der Malaria in Verbindung mit spezifischer Behandlung auf die syphilitischen Erkrankungen des Zentralnervensystems und der Gehirnnerven, wie die Beeinflussung der liquorpositiven, von Nervensymptomen freien Fälle durch diese Therapie im präventiven Sinne.** [Action of Malaria in conjunction with Specific Treatment in Syphilitic Affections of the Central Nervous System.]—*Med. Klin.* 1924. Sept. 14 & 21. Vol. 20. Nos. 37 & 38. (1031 & 1032.) pp. 1285–1287 ; 1326–1327. [2 refs.]

Since the procedure was as in Wagner-Jauregg's clinic, benign tertian blood was presumably used. 4 cc. were subcutaneously injected. Fever appeared between the 9th and 18th days, might be quotidian or tertian in spite of a clinically tertian donor, reached as a rule 40° to 41·5° C., and tended to lessen in severity after 7 or 8 attacks, so that in 3 out of the 15 cases it then spontaneously disappeared, but reappeared in 2 of them where no quinine had been given. The quinine treatment seems to have varied, and 2 cases of relapse occurred ; in one 1 gm. of quinine had been given daily for 9 days, in the other 1 gm. for 3 days and 0·5 gm. for 9 days. Accordingly it is advised that 1 gm. should be given daily for 14 days. From the nerve standpoint a combination of malaria with antisyphilitic treatment is advised and was found most efficacious where the cerebrospinal fluid was positive.

C. L.

Reese (H.) & Peter (K.). **Die Einwirkung der Malaria tertiana auf die progressive Paralyse.** [Effect of Tertian Malaria on Progressive Paralysis.]—*Med. Klin.* 1924. Mar. 23 & 30. Vol. 20. Nos. 12 & 13. pp. 372–376. With 4 charts in text. pp. 410–412. [42 refs.]

Infection was by subcutaneous or intravenous injection of 0·5 to 1 cc. of blood, the incubation period in the former being 10 to 25, in the latter 5 to 8 days. The absence of quinine idiosyncrasy was first determined; 12, 16 and 24 passages occurred without change in virulence. Five per cent. of cases were refractory to repeated injections, the suggested causes being some peculiarity in the technique, extravasation of blood into the subcutaneous tissue, and injection of too few parasites. It will be seen that a natural immunity is not listed. Infection was always by tertian malaria, which might be simple or double, either giving rise to the other. With the same strain a like number of parasites in the peripheral blood gave varying heights of fever. Icterus sometimes, splenomegaly rarely, appeared. Injection must be restricted to the strong; old and weakly persons must be rigorously excluded. A daily blood examination is an essential control. A temporary disappearance of fever was sometimes noted.

C. L.

LEY (Aug.). **Traitement de la paralysie générale par l'inoculation de la malaria tierce.**—*Bruxelles-Méd.* 1924. Nov. 2. Vol. 5. No. 1. pp. 1–3. [2 refs.]

This communication appears intended to bring to the notice of Belgian physicians the malaria treatment of general paralysis. Almost the only three malariological statements made are unfortunately incorrect, namely, that blood must be taken for transmission during an apyretic interval, that it must be injected *immediately* (the italics are in the original), and that such subcutaneous injection is actually equivalent to an immense mosquito bite.

C. L.

KYRLE (J.). **Die Malariabehandlung der Syphilis.**—*Wien. Klin. Woch.* 1924. Oct. 23. Vol. 37. No. 43. pp. 1105–1109.

Presumably *Plasmodium vivax* was used. Treatment was by 0·5 gm. of quinine bisulphate intravenously, repeated in 8 hours, next day 0·45 gm. of neosalvarsan, and within 24 hours two more double doses of quinine. No relapses were detected.

C. L.

BARZILAI-VIVALDI (Gemma) & KAUDERS (Otto). **Die Impf-Malaria—experimentell durch Anophelen nicht übertragbar.** [Experimental Malaria not Transmissible by Anopheles.]—*Wien. Klin. Woch.* 1924. Oct. 9. Vol. 37. No. 41. pp. 1055–1057. [3 refs.]

Because in the 4 cases in which they attempted it they failed to transmit to mosquitoes malaria which had been acquired by injection, the writers conclude that those suffering from injected malaria constitute no risk for any one in any land. A wide conclusion to rest on 4 mosquitoes.

C. L.

HORN (Ludwig) & KAUDERS (Otto). **Neue Erfahrungen zur Frage der Malariablutkonservierung.** [The Preservation of Malarial Blood.]—*Wien. Klin. Woch.* 1924. Oct. 30. Vol. 37. No. 44. pp. 1140–1142. [5 refs.]

For preservation of malarial blood, with a view to subsequent injection, over periods less than 48 hours it is advised that defibrinated blood be kept on ice ;. over longer periods that blood agar be used on which the parasites are believed not only to live but to develop. It does not seem to be realized that the possibility of such development is established.

C. L.

CRAIK (Robert). **The Blood in Mild Cases of Malaria.** [Correspondence.]—*Brit. Med. Jl.* 1924. Oct. 25. p. 788.

The bases of the conclusions are 4 relapsing cases of tertian malaria personally observed, and slides from several others supplied by asylum officers. It is concluded that no paroxysm is so slight as not to excite anaemic changes, which imply for erythrocytes an " unusually active normal regeneration, accompanied at the paroxysm with brisk pathological regeneration," and for leucocytes changes " characteristic of toxic anaemia." For adequate staining of erythrocytes it is advised to add to 8 cc. of " Manson's methylene blue " which has been boiled gently for one minute, 2 cc. of unboiled solution ; 2 drops of this mixture and 5 drops of 1 per cent. aqueous eosin in 1 ounce of distilled water are allowed to stain for half to two hours.

C. L.

GOROWITZ-WLASSOFF (L. M.). [**Essai d'une étude immunobiologique dans le paludisme. Réaction de fixation de l'alexine chez les paludéens.**]—*Bull. Soc. Phys.-méd. d'Orenbourg.* 1923. Nov. 5. [Summarized in *Bull. Inst. Pasteur.* 1924. June 30. Vol. 22. No. 12. pp. 486–487.]

Antigen may be obtained from the peripheral blood or placenta of an acute malaria, or from the brain in a cerebral case. Using 15 gms. of minced placenta in 100 cc. of distilled water with a few crystals of thymol, and 0·1 gm. of quinine hydrochloride to disintegrate plasmodia, shaking and filtering, the yellowish brown clear filtrate forms the antigen. It is concluded from the examination of 200 sera that antibodies appear within 15 hours and may last for 5 years. A positive reaction occurs in about 10 per cent. of persons having no previous malarial history. It is held that a negative reaction does not necessarily exclude malaria, that a positive one indicates present or past infection. [Clearly, in view of the writer's own finding, the last is assumption.]

C. L.

DE BUEN (Sadi). **El método de la gota gruesa en el diagnóstico del paludismo.**—Reprinted from *Arch. Cardiología y Hematología.* 1924. June. No. 6. 4 pp. [3 refs.]

Diagnosis was by a thick drop preparation stained with a watery solution of Giemsa, 1 drop per cc. of distilled water for 2 or 3 minutes, and then by a watery Leishman stain of the same strength for 6 or 8 minutes. It was found that, compared with smears and using 10 minutes for examination, the thick drop added 1·5 per cent. to the positives, and that it is particularly valuable for crescents.

C. L.

CHALAM (B. S.). **First Progress Report of the Campaign against Mosquitoes, Back Bay Reclamation Scheme, Bombay. Reviewing the Origin and Progress of the Anti-Malarial Campaign during the Period June 1923 to June 1924.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 481–487. With 3 figs & 2 charts in text. [5 refs.]

Seeing that the Port of Bombay has recently been lavishly distributing malaria by the shipload, at least as far as the Port of London, this account of the reclamation of Back Bay is of more than local interest. Sludge, mostly clay, from the harbour, is being led across the island in pipes and run out into Back Bay. The sludge sets into an impermeable mass, fissuring during solidification, water probably collecting in the fissures. The forcibly escaping sludge scoops out a deep depression at the end of the pipe line, and when the next section of pipe is added this water-containing hollow persists. Moreover, innumerable depressions cover the whole uneven surface of the new land, and it was anticipated that when the monsoon bursts they would constitute anopheline breeding places. It is precisely at this point that the Report breaks off.

C. L.

PHILLIPS (J. A. S.). **On the Results of Anti-Malaria Measures in Five Towns in the United Provinces.**—*Indian Med. Gaz.* 1924. May & June. Vol. 59. Nos. 5 & 6. pp. 221–228. With 3 maps. pp. 273–278.

A detailed consideration of the health of the towns of Saharanpur, Nagina, Kosi, Meerut and Lucknow before and after antilarval measures were instituted. Regarding Saharanpur, ROBERTSON pointed out in 1909 that irrigation from wells lowered the subsoil water, and, owing to the labour involved, rarely sufficed to saturate the ground to the extent of producing anopheline breeding places, whereas canal irrigation so raised the subsoil water that pools might form in depressions of the sodden soil. Accordingly canal irrigation and rice cultivation were forbidden in and near the town (a prohibition withdrawn in 1922), tanks and boggy land were filled and drains and nullahs cared for. In over 2,500 children examined on each occasion the percentage of palpable spleens fell from 78·8 per cent. in 1909 to 7·3 per cent. in 1923. In the same period the parasite index fell from 53·8 to 10·3. Under like conditions the spleen and parasite indices fell in Nagina from 79·1 and 44·4 to 13·49 and 6, in Kosi from 81·3 and 26 to 42·5 and 6·3, in Meerut from 5·9 and 6 to 1·3 and 3, and in Lucknow from 2·2 and 7·4 to 1·6 and 6·1. The possibility of positive lowering of the subsoil water is not considered.

C. L.

RODENWALDT (Ernst). **Speziesassanierung.** [Species Sanitation.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 8. pp. 313–334. [12 refs.]

For the benefit of German readers the writer emphasizes the familiar and what is probably the general procedure, that only those anopheles should be attacked which are definitely implicated as local hosts of malaria parasites. This he calls species sanitation. For instance, of the 28 species known in the Dutch East Indies, only three, *Myzomyia* *ludlowi*, *M. aconita* and *Myzorhynchus sinensis* are established as malaria carriers there. A knowledge of specific larval characters is a necessary preliminary to breeding-place elimination. The influence of numbers, natural infection rate, and house-haunting habits is noted. Large effects on the spleen index cannot be expected in a few months. Other than Dutch references are not listed, but mentioned in the text.

C. L.

THIROUX (A.). **La prophylaxie du paludisme dans les villages; les équipes itinérantes dans les colonies françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 341–346. [3 refs.]

There have been established in Annam itinerant antimalarial missions, each with a European doctor, his assistant, a public works officer, and a subordinate staff. Proceeding in automobiles they carry the materials for the erection of three huts, capable of being put together within four hours as mosquito-proof structures, two housing the staff and one acting as a dispensary. The huts are provided with electric light and fans, run evidently off the motor. The unit settles down in one place for several weeks on a suitable site, examines and treats the infected, discovers and eliminates anopheline breeding-places, and trains a local staff which will, or should, continue the necessary measures. Good roads or rivers are essential for such a programme, and an arrangement of loads which will not overtask any launch or ferry-boat which may have to be employed.

C. L.

ROUBAUD (E.). **Paludisme et agriculture; le rôle du bétail dans la prophylaxie antipalustre.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 346–353. [23 refs.]

Roubaud again presses, in somewhat modified form, his view regarding the influence of domestic animals in preserving man from anopheline attack. It is not reduction of anopheles which renders countries non-malarial, nor does he approve of the stress laid by others on improved well-being in this respect, but he holds that freedom from malaria depends essentially on the preference of certain anopheles for animals rather than for man. Man will be attacked (1) if there be too many anopheles to feed satisfactorily upon the available cattle; (2) if the cattle be not properly placed; (3) if they be of the wrong kind. The first condition is met by anopheline, mainly antilarval, measures; the second by the site and peculiarities of the animal house if the mosquito be a house feeder, or by the grouping of animals in the open if it be not, the results not being, however, foretellable; the third by providing the proper kind of scapegoat, which, if one may be permitted an Irish bull, is a cow for *A. maculipennis*, and a buffalo for *Myzomyia ludlowi.*

C. L.

KLIGLER (I. J.). **Malaria Control Demonstrations in Palestine. I. Malaria Control and its Cost.**—*Amer. Jl. Trop. Med.* 1924. Mar. Vol. 4. No. 2. pp. 139–174.

This paper considers work done. A reduction of between 70 and 90 per cent. of the estimated malaria was effected. Breeding places of mosquitoes in Palestine are mainly artificial and controllable by continuous development of sanitary habit and satisfactory treatment. A large measure of control was obtained for P.T. 50 per head in the first year, and for less afterwards.

C. L.

MOUTOUSSIS (Constantin). **La lutte contre le paludisme.**—*Grèce Méd.* 1924. May. Vol. 26. No. 5. pp. 42–44.

The malaria problem in Greece has been intensified by the return of demobilized soldiers and the arrival of refugees, both infected. The writer is much impressed by the methods in use in Italy, and their obvious applicability to Greece. The basis is an instructed public opinion founded on an instructed antimalarial personnel, consisting of doctors, assistants, engineers and agriculturists, controlled by a Ministry of Health.

C. L.

GRASSI (B.). **Malariabekämpfung mit "Mikrothan" und "Larviol."** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Sept. Vol. 28. No. 9. pp. 406–408.

Mikrothan is used against the imago, a 5 per cent. solution being squirted upon them by an ordinary garden syringe as they sit on the walls of stables. Anopheles, particularly females, culices and flies can then be found thick on the ground. Mikrothan has such a pleasant attractive smell that in a short time the walls will again be studded with attracted mosquitoes.

Larviol, 15 gm. to the square metre, was sprayed on water containing many larvae. None were found there next day. It appears to be a heavy oil, since it is referred to as less inflammable than petroleum. The question of cost and comparative tests is not opened, but the makers are quoted as holding that ducks can drink the water soon after spraying, and that fish survive—if the water be deep enough.

C. L.

HANSCHELL (H. M.). **The Prevention of Sub-Tertian Malaria—(Failure of Quinine).**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 57–62.

"This paper is an attempt to show that by indirect experiment, where fairly exact control was obtained over the human subject and the quinine, but very little control over the mosquito, 5 grains of quinine daily did not prevent the development of the sporozoits of *P. falciparum* in the human host." The common factors in this experiment were :—a five-grain tabloid of quinine sulphate taken every day with the evening meal ; no lights being allowed after dark, every one was under his net well before this ; every mosquito bite was noted at a daily morning inspection, all being found below the elbow ; about 300 mosquitoes were caught in the boys' compound, 50 per cent. being anopheles and 5·5 per cent. being found infected on dissection ; the officers' huts lay between the men's huts and the boys' compound ; prior to the experiment blood films of all were examined and found negative ; six of the nine officers and none of the men had previously been in the tropics. The only apparent difference between officers and men lay in the use by the former of three-foot wide, purchased, mosquito nets, by the latter of 18-inch wide, issued, ones. No officer ever experienced a bite, suffered from fever, or showed plasmodia in the blood. All the men went down one by one with subtertian malaria after showing from 13 to 31 bites and taking the single quinine tabloid for from 78 to 102 consecutive days. Immediately on showing malaria each man slept thenceforward under a three-foot wide mosquito net and was given three tabloids of quinine sulphate (15 grains or 1 gm.) for 14 days only, after which he had no more quinine at all. No fever lasted more than three days. There were no relapses. That fact, and the buzzing in the ears accompanying the administration, showed that the tabloids were efficacious. An unpleasantly confirmatory personal experience closes the evidence, which should be studied in detail, is presented with completeness and clarity, and appears to lead to inevitable inductions.

C. L.

i. SHELTON (C. F.). **The Malarial Parasite Index amongst Native Children of Arusha and Surrounding District. Appendix No. V.**—*Tanganyika Territory. Ann. Med. Rep. For the Year 1922.* pp. 90–91.

ii. OBREGIA (A.) & POPEA (A.). **Deux cas de psychose palustre. (Étude anatomo-clinique.)**—*Bull. et Mém. Soc. Méd. Hôpit. de Bucarest.* 1924. May. Vol. 6. No. 5. pp. 136–140.

iii. KIDSTON (T. A.). **The Prophylaxis of Malaria as applicable to the Naval Service in Time of War.**—*Med. Jl. Australia.* 1924. May 17. 11th Year. Vol. 1. No. 20. (Supplement). pp. 317–319.

iv. LANGER (Joseph). **Autochthone Malaria und Schwarzwasserfieber bei der 6 jährigen Tochter eines Prager Kriegsmalarikers.**—*Med. Klin.* 1924. May 11. Vol. 20. No. 19. pp. 636 637. [13 refs.]

v. BROSIUS (Otto Tiemann). **Cerebral Malaria. Report of an Unusual Case.**—*Jl. Amer. Med. Assoc.* 1924. Sept. 13. Vol. 83. No. 11. pp. 841–842. [1 ref.]

vi. LELLIS (Areobaldo). **Impaludismo e Molestia de Addison.**—*Brazil-Medico.* 1924. Aug. 2. Year 38. Vol. 2. No. 5. pp. 67–68. With 1 fig.

vii. GLASNIK MINISTRSTVA NARODNEGA ZDRAVJA. Belgrade. 1924. 69 pp. With 63 figs.—[**Une exposition relative au paludisme à Belgrade.**]—[Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1924. July. Vol. 16. No. 7. pp. 927–928.]

viii. 1924. 50 pp. With 1 map.—[**La paludisme à Belgrade en 1923.**]—*Ibid.* pp. 926–927.]

i. Of 50 children examined, all but 2 under 10 years old, 4 of the 5 cases of malaria discovered were possibly attributable to infection acquired elsewhere.

ii. In two mental cases autopsy revealed malaria and Marinesco's nodules in the brain. The psychoses are attributed to malaria.

iii. The recognized principles of malaria prophylaxis are applied to ships and to camps, temporary or more permanent, of landing parties.

iv. Parasites were not found. Urine drawn by catheter was blood red.

v. A feverish case with tetanoid convulsions and unconsciousness was detected as malarial when once the blood was examined. Intravenous injections of 6 grains of quinine bihydrochloride three times a day for three days, followed by oral quinine, resulted in cure.

vi. A case of malaria followed within a few weeks by asthenia, pigmentation, tachycardia and exaggerated knee-jerks. The condition improved after injection of suprarenal extract.

vii. There being a million malaria subjects in the kingdom of Serbia, the Tropical Diseases Laboratory at Belgrade has opened an exhibition illustrating the aetiology and distribution of malaria, the anopheline breeding-places, the means by which infection may be prevented, etc.

viii. In 1,881 persons examined the parasite index detected was 47·2, and those in which the splenic index was also positive 60·4. *P. vivax* was implicated.

C. L.

i. Brahmachari (U. N.). **Difficulties in the Diagnosis and Differential Diagnosis of Malarial Fevers.** -*Calcutta Med. Jl.* 1924. Apr. Vol. 18. No. 10. pp. 683–697.

ii. Goresco (C.) & Popesco (C.). **Le rôle du néosalvarsan dans le paludisme.** -*C. R. Soc. Biol.* 1924. July 18. Vol. 91. No. 25. pp. 500-501.

iii. de Castro (A. Bayley). **A Case of Double Malarial Infection, complicated with Typhoid Fever, in a Patient Six Months Pregnant.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. p. 463. With 1 chart.

iv. Boyd (J. S. K.). **The Principles of the Prophylaxis of Malaria: with the Administrative and other Measures for their Application on Active Service.**—*Jl. Roy. Army Med. Corps.* 1924. Aug. & Sept. Vol. 43. Nos. 2 & 3. pp. 95–100: 182–201. [15 refs.]

v. Tricoire (R.). **Accès palustres à forme pulmonaire.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 568–569.

vi. Wilson (C. J.). **Latent Malaria.**—*Kenya Med. Jl.* 1924. July. Vol. 1. No. 4. pp. 113–116.

vii. Maslova (A. N.). **The Changes in Quantity of Blood Platelets (Bizzozero) and the Velocity of Coagulation of the Blood in Malaria.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 3. In Russian. pp. 7–14. With 1 chart in text. [16 refs.] With English summary.

viii. Ljachowezki (A. M.). **Die isoagglutinierenden Eigenschaften des Blutes bei Malaria.**—*Ibid.* No. 1. In Russian. pp. 20–23. [6 refs.] With German summary.

i. The manner in which malaria may simulate and complicate all diseases is aptly illustrated from the Rai Bahadur's ripe experience.

ii. Working in Bucharest the writers find that neosalvarsan does not kill the subtertian parasite, but acts as a satisfactory provocative. They suggest, without offering evidence, that this unmasking effect probably renders the parasites more accessible to quinine.

iii. Both tertian and subtertian parasites were identified. Quinine was given. The diagnosis of typhoid was clinical. The fever lasted 14 days, a rise on the last day being due to a quinine abscess. Pregnancy was not terminated.

iv. This paper constitutes the Parkes Memorial Prize Essay, and consists of a résumé, historical and practical, of the appalling effects which malaria may have upon an army, and of the best means of control of which we have cognizance.

v. In two case where pneumonia was convalescing intercurrent malaria—in one case benign, in the other malignant tertian—brought on acute pulmonary congestion with expectoration of blood containing parasites. Both cleared up under quinine.

vi. The admirably frank reasoning shows that a number of Africans who died of divers complaints were, as the march of events showed, in all probability ill of malaria.

vii. In examination of fifty cases of malaria it was found that, in the great majority, during the period of the attack the quantity of blood platelets (Bizzozero) and the coagulation time are lessened.

viii. Neither fever nor quinine in large doses alters the agglutination of the blood. Those ill of severe malaria belong mostly to groups I and II of Moss. Those in group IV withstand malaria most easily.

C. L.

i. MEHEMMED (Kadri). **Ein Fall von Mischinfektion mit drei Arten der Malariaparasiten.**—[Infection with Three Species of Parasites.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. July. Vol. 28. No. 6. pp. 236-237.

ii. BITTER (Ludwig). **Das Vorkommen von Malaria quartana in Norddeutschland.**—*Deut. Med. Woch.* 1924. June 27. Vol. 50. No. 26. pp. 880-881. With 1 chart in text. [3 refs.]

iii. ALESSIO (Francesco). **Sopra un caso di splenomegalia cirrogena da malaria.**—[A Case of Malarial Cirrhotic Splenomegaly.]—*Gaz. d. Ospedali e d. Cliniche.* 1924. June 15. Vol. 45. No. 24. pp. 555-559. [7 refs.]

iv. STRANSKY (Erwin). **Zum Kapitel : Malaria und Epilepsie.**—*Muench. Med. Woch.* 1924. June 13. Vol. 71. No. 24. pp. 787-788. [7 refs.]

v. HINES (Laurence E.) **Accidental Malarial Infection in Syphilis of the Brain.**—*Jl. Amer. Med. Assoc.* 1924. Oct. 11. Vol. 83. No. 15. pp. 1161-1162. With 2 text figs.

i. A Turkish soldier in Asia Minor showed schizonts of tertian and quartan and gametes of subtertian malaria. Under quinine the tertian forms disappeared first, leaving crescents and disorganized quartan parasites, the crescents still persisting after 16 gm. of quinine had been taken over 23 days.

ii. A case of quartan malaria, microscopically verified and clinically typical, was acquired in Kiel, apparently the only case on record in Schleswig Holstein during this century, although formerly it seems not to have been uncommon in Northern Europe, especially in South Holland.

iii. There was a history of malaria contracted some 7 years earlier, and pigment was found in the spleen. Wassermann's reaction gave complete haemolysis. Alcohol is not mentioned. No plasmodia were found.

iv. Seeing that epileptic symptoms may complicate a malaria, or malaria may complicate epilepsy, a case is discussed in which a man, originally nervous and made more so by war service, contracted subtertian malaria with 24 hours' loss of speech and subsequent epileptiform attacks.

v. The man died untreated from cerebral subtertian malaria. There was no anatomic evidence that the syphilitic lesions were changed by the malaria infection.

C. L.

MALARIA (CORRESPONDENCE).

CATANEI (A.). **Essai critique sur la morphologie des parasites du paludisme.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Vol. 1. No. 1. pp. 10-108. With 3 plates. [59 refs.]

Regarding the last and critical sentence of the notice of his paper appearing in this *Bulletin*, Vol. 21. p. 608, Catanei writes that he had rigorously excluded therefrom all reference to the phylogenic position of the classical types of malaria parasite ; and that while he invoked the absence of quinine administration as explanatory of the appearance of atypical forms, it is illogical to attribute to him the inverse conclusion, namely, that it is quinine treatment which maintains true to type *P. vivax*, *P. falciparum* and *P. malariae*.

NATIVE DIETARIES.

MacRae (Donald M.). **Diet in Relation to Health and Disease in the Tropics and Subtropics.**—*S. African Med. Rec.* 1924. Mar. 22. Vol. 22. No. 6. pp. 122–125.

The object of this paper is to confound those faddy physiologists who teach that too much nitrogenous food is eaten in the tropics. That white people living in the tropics should conform more or less to the diet of the native is shown to be absurd and harmful, since the native himself is living upon the very edge of starvation. Examples proving these contentions are quoted from the author's personal experience in Bechuanaland Protectorate and from the literature, special emphasis being laid upon the splendid work done in this respect by the Americans in the Philippines. Not only a liberal supply of protein but also of carbohydrate and fat is as essential in the tropics as anywhere else.

The author's attitude may well be summed up in a quotation from Woodruff: " We formerly starved in summer and prayed for cold weather, so that we could eat. If we had only eaten better we need not have prayed so hard ! "

A. D. Bigland.

Jansen (B. C. P.) & Donath (W. F.). **The A-Vitamin-Content of Different Indian Foodstuffs, and the Value of the Proteins of these Latter, as a Supplement to the Proteins of Rice.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1924. Pt. 1: pp. 46–98. With 19 graphs. [Numerous refs. in footnotes.]

Rice protein with regard to its amino-acid content is of good biological value, yet it is not sufficient as the sole source of protein. Accordingly, in man, when rice is the main article of diet this defect must be overcome by the supply of other proteins. Rice is also defective as regards its vitamin A content.

The object of this research is to ascertain which proteins in common use in the Dutch Indies are most suitable for correcting the protein deficiency of rice and also to discover the best means of increasing the vitamin A factor. From experiments on white rats the authors classify local foodstuffs into three groups according to their vitamin A content :—

Group 1.—Those which are very rich in this factor, and of which 1–5 per cent. added to the diet makes it sufficient.

Fruits.—Banana, sawu manila [*Acheras sapota*, L.], papaya, avocado, and djambu [*Eugenia*].

Vegetables (fresh and boiled).—Pods and leaves of katjang pandjang [*Vigna catjang*], leaves of the cassave plant, kangkong leaves [*Ipomaea aquatica* Forsk.], pumpkin, terong lalab [*Solanum trongum* Poir.] and fresh cucumber. Labu ajer [*Lagenaria*], terong sajur [*Solanum melongena*, L.], and lobak [*Raphanus radicula*] perhaps just fall within this group.

Other foods.—Duck eggs, fresh or salted, butter, tinned or frozen, and cod-liver oil.

Group 2.—Includes those foodstuffs which when used exclusively in the diet will not prevent the symptoms of A-avitaminosis, viz., rice, polished and unpolished, maize (at least the white variety), coco nuts and pea nuts and the " press-cake " made from the two last.

Group 3.—Includes foodstuffs which even up to a ration of 10 per cent. do not compensate a diet already poor in vitamin A, viz., meat, katjang idjo, soy-beans, tempe kedele,* dried fish, dried shrimps, terassi†, and oil-palm-oil.

The experiments regarding the biological protein value of these foodstuffs have apparently not yet been completed. From the results so far obtained it would appear that the proteins of soy-beans, tempe kedele and milk are very powerful in compensating rice deficiency; in this respect even more so than meat.

The authors conclude with the simple statement that the use of one banana a day will probably prevent A-avitaminosis in those living upon a rice diet.

A. D. B.

PECK (Eugene C.). **Note on Vitamine C in Sweet Potatoes.**—*China Med. Jl.* 1924. Feb. Vol. 38. No. 2. pp. 125–127. [5 refs.]

The sweet potato is an important food in warm countries and is therefore worthy of dietetic study. The author states that "its energy content is about four times that of lettuce or cabbage; its protein, although low, is better than in the greens; its ash is about the same as in leaves, and it is a valuable source of Vitamines A, B, and C."

Apparently these statements meet with universal acceptance with the exception of the Vitamin C content of the sweet potato. Some workers have stated that there is none of this vitamin present at all. Accordingly, experiments were carried out with guineapigs to ascertain the true position of affairs. The results show that "ten gm. of raw peeled sweet potato is amply sufficient to furnish enough vitamine C each day to prevent and cure scurvy in a guineapig." From further experiments, not yet completed, it appears that sweet potatoes baked in the ordinary way still contain a considerable amount of vitamin C.

A. D. B.

JANSEN (B. C. P.) & DONATH (W. F.). **Metabolic Experiments on Rats and Digestibility of the Proteins of Some Foodstuffs.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1924. Pt. 1. pp. 25–45. With 1 plate & 1 fig. [11 refs.]

Walu or labu leaves (*Curcurbita pepo*, L.) contain a large amount of protein, so that it seemed advisable to the authors that experiments should be carried out upon rats with regard to the ready-digestibility or otherwise of this protein. The results show that the proteins in question are digested a little more readily than those of unpolished rice but less readily than those of polished rice. In experiments upon the human subject similar relative results were obtained, but the absolute figures were somewhat lower.

A. D. B.

SOPP (Eva). **Bananens vitaminindhold.** [The Vitamin Content of the Banana.]—*Norsk Magazin f. Laegevidenskaben.* Kristiania. 1924. Sept. Vol. 85. No. 9. pp. 732–735. With 2 charts.

Banana is an excellent food for children, for it contains 19–20 per cent. sugar and starch, 4–5 per cent. protein and ½–1 per cent. fat. It is, however, essential to know whether it contains sufficient vitamins. Previous workers agree that the B and C vitamins are present, but contradictory results have been obtained with regard to A. The supply of A-vitamin in the food is of vital importance in the case of children.

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* Prepared by fermentation with boiled soy-beans.

† Half-dried shrimps or fish pounded into a pulp and left to ferment.

Young rats were put on a basic diet free from A-vitamin till they began to lose weight and show signs of A-deficiency. The majority had very advanced xerophthalmia. They were divided into three groups. Group I received bananas *ad libitum* in addition to their basic diet; Group II received 1 gm. banana (each rat) daily in the basic diet; and Group III received 2 gm. banana daily in the basic diet. All the groups began to improve after a fortnight on the banana diet, the eye lesion being the first to show a change. In 3 weeks' time there was an improvement in the general condition and the weight began to increase. The rats grew steadily until the end of the experiment, when they were fully developed. The accompanying curves show that the only difference between the groups was that Group I increased most quickly and eventually attained the greatest weight, while Group III had a similar advantage over Group II. Two control series were made, in one of which the young rats received banana *ad lib.* with their basic diet from the first, while in the second they received their basic diet without any banana. The latter group soon fell sick and were all dead in 7 weeks, but the former thrived well.

The experiments show that the disease-preventing or healing component of the A-vitamin in the banana is very active, while the growth-promoting component acts rather more slowly but is present in sufficient quantity. If, as there is no reason to doubt, these results can be applied to man, the banana may be regarded as an ideal food, for it is not only very nutritious, easily digestible and palatable, but also contains an adequate quantity of the A-vitamins so important for young individuals. The daily dose for an experimental animal was 1 gm. banana per 50 gm. body-weight. For a child of 3 years, whose weight is about 12–14 kilogm., it should be 240–280 gm. banana per diem, or 4 to 5 bananas. Considerably smaller quantities, however, ought to be sufficient.

E. E. Atkin.

MISCELLANEOUS.

FUKUSHIMA (Hisashi). **Recent Prevalence of Influenza and its Prophylactic Vaccination in the Japanese Navy.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 733–736.

Between March 1918 and February 1922 there were five epidemics of influenza in the Japanese navy affecting 30,053 persons and causing 431 deaths. The first epidemic affected 12,000 men and was without mortality, the second and third affected about 4,000 men with 130 and 212 deaths, and the fourth and fifth affected some 2,000 men each, with 7 and 8 deaths. For prophylactic vaccination *B. influenzae* and the pneumococcus were employed. About three-quarters of the average strength were vaccinated at three separate periods. The author concludes his discussion of the results with the remark that its efficacy has not been established.

A. G. B.

TEN BROECK (Carl). **The Immunity associated with the Presence of Tetanus Bacilli in the Digestive Tract.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* p. 710.

In Pekin a third of the population has been found to carry typical tetanus bacilli in their digestive tracts. Infection, however, is rare in spite of the use of human excreta as fertilizer. Examination showed that the blood of the tetanus bacilli carriers contained antitoxin, whereas that of the non-carriers had none, but the serum of these often agglutinated the bacilli suggesting that they had been carriers and possessed potential immunity. The youngest carrier was aged five.

A. G. B.

i. MARJORIBANKS & O'DRISCOLL. **Observations on Epidemic Encephalitis Lethargica in Sarawak.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 806–815.

ii. LALUNG-BONNAIRE, MOTAIS fils & PONS. **Encéphalite léthargique en Cochinchine.**—*Ibid.* pp. 817–823.

i. Encephalitis lethargica was observed in Sarawak for the first time in 1923 when 8 cases came under notice. Its origin is obscure. The infected persons lived in different parts of the country and intercommunication was very improbable. The clinical features were of an irritant rather than a somnolent type. The constant symptoms were headache; twitching of groups of muscles, anaesthesia and neuralgia; constipation; tachycardia. Four died. Details are given of each case. The authors point out that in such an illness in the tropics besides the cosmopolitan diseases one has to consider malaria and sun exposure. One case simulated belladonna poisoning.

ii. The disease was first seen in Saigon in 1922, since when about 12 cases have been admitted to hospital. Details are given of five. Inoculations were made into rabbits and an affection transmissible to successive animals produced with the characters described by LEVADITI. The authors think that the disease has been present in Cochin China for a long time.

A. G. B.

DE LANGEN (C. D.). **The Chemical Compositi [illegible] Stones in the Dutch East Indies and their Detection dia [illegible] by Means of Roentgen Rays.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 769–778.

Dr. de Langen returns to this subject (see this *Bulletin*, Vol. 20, p. 648). In the Dutch East Indies the well-known facetted cholesterin stones are hardly ever found, and in the rare instances of the presence of gall-stones they are soft, brown pigment stones, often at some depth in the substance of the liver. He has collected stones from 27 patients, 20 of whom were natives, for the purpose of chemical examination. In 6 of the 20 they were found in the liver and not in the gall bladder, in 5 in the gall bladder only, and in 9 in both situations; in Europe intrahepatic stones are rare. The analysis of the stones shows cholesterin 0·9—20 gm. (in only 3 instances above 9·0), bilirubin, 28·7–70, and calcium oxide 4·2–44·3; bilirubin salts form in the majority of cases 50–60 per cent.; the cholesterin is low, whereas in Europe it constitutes 80–90 per cent. The native stones have the same contents as the gall; they are, in fact, dried gall. Cholesterin stones are rarely seen in an X-ray examination, but as the percentage of chalk increases so does the shadow thrown; X-ray diagnosis is therefore of greater value in this respect in the Dutch East Indies than in Europe. These brown pigment stones are the direct consequence of a chronic inflammation of the biliary ducts. As has been stated before, the low cholesterin content of the stones is attributed to the low percentage in the blood, and this again to the small proportion of lipoids in the food of the natives of the Dutch East Indies.

HONNA (F.). **Ueber die Noma.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore, 1923.* pp. 830–844.

The author at Taihoku, Formosa, sees noma fairly frequently among the Chinese in that island and tabulates 12 cases, all but one in children under eight. It is usually a sequel of measles. The prognosis is bad, the mortality about 92 per cent. The disease is temporarily improved by salvarsan treatment, but injection often fails owing to lack of supply of arterial blood and local application of the drug is advised. The etiology is discussed at some length.

A. G. B.

GALLOWAY (David J.). **Opium Smoking.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 864–885.

The author has had through his hands a very large number of persons who smoked opium or used it in other ways, and he has here tabled a considerable body of varied and significant statistics of the subject, besides discussing his observations on opium-smoking among his Chinese clients in particular.

He is of opinion that the Chinese, like certain elements of the population of India, possess a certain amount of immunity to opium, and that this idea of a limited immunity is, inversely, corroborated by the undoubted fact that they display a peculiar susceptibility to iodine, ipecacuanha, and belladonna, and also—when addicted to opium—to mercury.

As to the acquisition of the habit of opium-smoking, the better class of native Chinese (not the Straits-born Chinese, with whom the use of opium is not in favour) take to it as one of the customs of luxurious ease; but among the poorer Chinese (and also occasionally among the wealthier class) it is deliberately adopted for the relief of abdominal pain—particularly, among women, of pelvic pain—and the nocturnal pains of syphilis, and for its acknowledged therapeutic effect in phthisis, diabetes and other forms of glycosuria, and malaria.

The author describes his observations of the effects of opium-smoking, immediate and remote. At the beginning of the performance there is a rise in pulse-rate and blood-pressure, which is soon followed by a steady fall to below normal; and there is a slight feeling of exhilaration, which passes into a state of relaxation and restfulness and then of slight and brief narcosis from which the smoker emerges with faculties fully—sometimes praeternaturally—alert. The habit has some obscure adverse effect upon nutrition—there is usually a tendency to emaciation, even among the well fed—but it does not seem to shorten life. The statements that smoking in moderation is impossible and that the dose must be steadily increased are not at all in accord with the author's observation. The habit certainly takes this much hold: that sudden deprivation causes feelings of anxiety and faint stomach and incapacitates the individual for 2 or 3 days; and, in the case of old and heavily addicted smokers, may cause all the physical symptoms of shock and collapse. The author has included his experience of the effects of opium-smoking on 58 women, 38 of whom began to smoke before the age of thirty. No disturbances of menstruation were manifested. Of the younger women 22 had borne children during the persistence of the habit, one had had 7, two had had 6, and families of 3 and 4 were numerous.

It is in the lower ranks of society that the bad effects of opium-smoking are observed. Excessive smokers commonly suffer from diarrhoea and severe abdominal pains, pyoalveolitis, and a loose phlegmy cough; but the one constant and unmistakable sign is a lividity—a dull earthy pallor or bronzing—not accompanied by dyspnoea, and as characteristic of the opium sot as is the "kidney face" of chronic renal disease; concomitant with this lividity is tachycardia. These stigmata, which do not necessarily imply any physical or mental incompetence, have been observed in only 59 of the author's cases.

The belief that excessive opium-smoking is a cause of insanity is not supported by the author, nor by two successive superintendents of the local lunatic asylum. Of 38 patients admitted between 1893 and 1908, whose insanity was alleged to be due to this form of intemperance, the condition in 29 could be definitely traced to other causes and in the remaining 9 could *not* be definitely attributed to opium.

Unlike the Chinese the Malay races seem to be peculiarly and very ominously susceptible to opium. The control of the drug in the Malay States is therefore a more than ordinary complication of public-health, economic, political, and ethical problems, with the crucial points of which the remainder of this most interesting paper is mainly concerned.

A. Alcock.

ASPLAND (W. H. G.). **China and Narcotics.**—C [illegible] *d. Jl.* 1924. July. Vol. 38. No. 7. pp. 563–568.

The author is Secretary of the Internation [illegible] um Association, Peking, and has investigated the am [illegible] rcotics and cocaine used for legitimate medical purposes i [illegible] which would appear to be largely an exercise in guessing. He says that fifty times the legitimate amount of morphia is smuggled into China. He quotes a statement made by "Dr. CHODZKO of Japan" to the League of Nations Health Committee on the mortality of opium smokers in Formosa. It is to the effect that among fifty thousand licencees the mortality is found to be 80 per mille, whereas that among non-smokers does not exceed 20–25 per mille.

A. G. B.

FITZGERALD (R. Desmond). **A Thesis on Two Tropical Neuroses (Amok and Latah) peculiar to Malaya.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 148–160. [12 refs.]

VAN LOON (F. H.). **Latah, a Psycho-Neurosis of the Malay Races.**—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1924. Part III. pp. 305–320.

GALLOWAY (David J.). **On Amok.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 162–171.

We must disagree strongly with the statement made by Dr. Fitzgerald in his paper on "Latah" that there is no connexion between Insanity, Hysteria, and Epilepsy. Insanity, of course, is merely a legal term, and has no definite medical meaning, for a hysterical or an epileptic patient may easily require certification as insane if the disorder of conduct is sufficiently marked as to give rise to danger to others or to the patient himself. Hysteria and Epilepsy, on the other hand, are the names applied to certain groups of mental disorders in both of which the fundamental diagnosis rests on there being a disturbance in regard to the relation between consciousness and the performance of motor reactions. The major fits in both disorders may be indistinguishable, in both there may be outbursts of conduct which appear quite purposive in nature, but which are unaccompanied, or at any rate only partially accompanied, by conscious awareness and control on the part of the subject, hysterical manifestations and epileptic fits may occur in one and the same individual, and in both disorders certain secondary reactions or extensions of the mischief may arise which lead to more severe mental disturbance and "insanity." The great difference between them lies in the fact that the hysterical reaction depends to a great extent on the social surroundings, whereas the epileptic is more personal to the patient and relatively independent of environmental influence; both are manifestations of a weakness of the individuality in that there is a tendency to a splitting up, or a dissociation, within the mental function in the presence of subjective stress.

Now these two disorders of Latah and Amok seem to bear a striking resemblance in many ways to the European Hysteria and Epilepsy in many of their symptoms. Latah would appear to be a condition typically arising in individuals of strong affective tendencies, highly emotional, highly sensitive as regards sensory perceptions, and with a marked failure of the self-assertive tendency in regard to their relations with other individuals. Van Loon points out that the incidence is much higher amongst women, and particularly where the patient has worked in association with European households, such situations naturally bringing about an intensification of the submissive attitude in the personality. The main differences between the actual symptomatology of the Asiatic and European disorders would seem to be explicable, partly on the more primitive mental development of the Malay race which Van Loon notes, and also on the more primitive relationships within the social order which we think he has failed sufficiently to take into account.

Of the two writers whose papers on this subject are here considered, Dr. Fitzgerald discusses the condition from the point of the objective manifestation and the practical outcome of the disorder. He classifies his cases into five groups, which are as follow: (*a*) subjects of high nervous sensibility; (*b*) emotional subjects; (*c*) suggestible individuals; (*d*) individuals with weak intellectual capacity; (*e*) women; and it is hardly necessary to point out that the total picture called up by these five terms gives a very good representation of the typical hysterical mentality in European countries. In addition, the author touches upon the medico-legal aspect which these cases may present in the event of injury to other individuals or to property as a result of the conduct of the patient during an attack of the malady.

Dr. Van Loon's paper is more comprehensive in that he deals with a wider field, the results of his questionnaire which he sent to a large number of medical men being of great importance and interest, and also he sets himself the task of dealing with the subjective disturbance in the mind of the patient. Here the difficulty lies, as he points out, in the understanding of the more primitive mentality of the native mind, but he analyses such material as he has obtained from the patients in regard to their own feelings and motives for their behaviour, and he concludes that " Latah is a disorder grown on the soil of the predisposed Malay psyche, in which chiefly the primitive way of reacting on affects of fright and on acute emotions, and a strong imitative-hyper-suggestibility play their part."

Amok, a condition of a furor of excitement with much motor restlessness, appears to resemble hysteria in that the outburst may be provoked by an emotional stress, to resemble epilepsy in that the conduct is often purposive and automatic, and to bear a relation to the excitement of acute confusional and delirious states in that it is not infrequently associated with some profound toxic infection of the patient such as malaria. We must again disagree with Dr. Fitzgerald, who would apply the term " neurosis " to the condition, for it is clear that no more acute psychosis could possibly be conceived than one which gives rise to violence of a homicidal character such as is met with in the runner amok. He finds much to indicate the close relation between the disorder and the automatic conduct following an epileptic fit, and while allowing himself to regard malaria as a cause, he deprecates the determining value of drug intoxications in favour of more purely psychic causation.

Sir David Galloway, whose paper on this subject also enters into this review, again writes from a broader standpoint. He refers to the fact that the term " amok " was once applied to those forms of collective excitement when whole tribes exhibited violent fanatic behaviour, but this usage has apparently been abandoned. He would not regard post-malarial or other feb nent, or the frenzies which accompany epilepsy or oth disorders as "amok," but he would keep the term to apply culiar native reactions to strong emotional stress where the cause must lie in the innate constitution of the mind. He separates out two main groups: the first where the outbreak results immediately as the consequence of some acute fright or injury to the self-esteem, and in which the patient immediately attacks the object of his anger and follows by an indiscriminate murderous frenzy, and the second, where the outburst is preceded by a period of sullen pre-occupation. He regards the subjective mechanism as one of an acute emotional storm welling up out of the subconscious mind, and therefore expressing itself most directly in the most primitive form, that of uninhibited destructive violence.

Thomas Beaton.

Hogg (C. A.). **Twelve Cases of Insanity in Australian Aboriginals with a Commentary. Taken from the Records of Parramatta Mental Hospital, New South Wales.**—*Med. Jl. Australia.* 1924. June 21 & July 5. 11th Year. Vol. 1. No. 25 & Vol. 2. No. 1. (Supplement) pp. 455–456; 457–458.

Bostock (J.). **Insanity in the Australian Aboriginal and its Bearing on the Evolution of Mental Disease.**—*Ibid.* July 5. 11th Year. Vol. 2. No. 1. (Supplement) pp. 459–464. [12 refs.]

The Australian Aboriginal, by virtue of his long isolation from the rest of mankind, is a unique object for anthropological investigation, and it is of great importance that any facts having a bearing on his make-up, both physical and mental, should be carefully recorded. The two papers here reviewed deal with such cases of aboriginals as have come under observation and care in the mental hospitals of New South Wales and Western Australia, and as the study of the abnormal is often most enlightening in relation to our knowledge of the normal, the subject matter is of considerable psychological interest.

Dr. Hogg deals with twelve cases only from the Parramatta Mental Hospital, New South Wales, and he classifies them as follows: "Of these twelve patients, nine were males and three females; 33·3 per cent. were congenitally deficient; 16·6 per cent. were due to drugs (alcohol); 25 per cent. were in a state of excitement and exaltation. Of the remaining 25 per cent., one was associated with epilepsy, one was suffering from phthisical insanity and one suffered from general paralysis of the insane." Five were charged with criminal offences, a very high percentage as compared with European standards, and of the total, as a result of treatment, three recovered, four remained chronically insane, while five succumbed to physical maladies and died. The author apparently had no difficulty with the mental classification, and evidently the form of the disorder showed little variation from the accepted civilized description; but there was evidence of a failure of the elaboration from the ideational point of view which is characteristic of many European psychoses. He states:—

> "All these cases in comparison with white patients showed: (1) A want of organisation of the sentiments; (2) a low form of perception; (3) poor association and poverty of ideas; (4) absence of acquisitiveness and no constructive ability; (5) tested by the Terman scale their native intelligence far below that of the white; (6) little power to appreciate and adapt

themselves to the social standards of honesty and sexual morality, etc., which are those of the white community; (7) strong and ruling passions of the animal nature"; (8) the female imbeciles being married there is a doubt thrown upon the selective capacity of their spouses, and, "(9) several had corneal opacities."

Dr. Bostock deals with a greater number of cases from a wider area, and he calls for a thorough investigation of the aboriginal from the full psycho-physiological aspects, while the material is still available. He finds it necessary to resist the temptation to classify his series of cases under a modern terminology, though he admits that no novel form of disorder is met with, but he finds differences between the aboriginal and the white in the greater tendency to the development of pulmonary phthisis, the tendency to more early dementia, and the larger percentage of patien s who show destructive, violent and untidy habits. Applying the dogma of Hughlings JACKSON, he suggests that the thalamic level was under poor control; just as the child reacts to unpleasant stimuli by an attack of hypomania, screaming and crying, or by depression, sulking, so does the aboriginal lack the finer reactions.

Mental deficiency, Dementia Praecox, the Manic-depressive group, and the toxic confusional conditions, including General Paralysis of the Insane, were met with, nor were there wanting the senile and arteriopathic states. These findings, of course, were to be expected, as there is no reason to suppose that civilization or intellectual development would modify the underlying causes of such conditions. Where, however, the aboriginal showed his peculiar characteristics was in the "colouring" or the actual mental content of the psychoses. This was invariably of a primitive and childish nature. Such false perceptions or delusional ideas as were manifested were of a simple type of symbolism, and in no case was there any secondary ideational elaboration into systems of delusional beliefs or of rationalization processes. The aboriginal is a motor reactor pure and simple; he has little to do with imagination or other subjective thought processes; the simple delusion or hallucination is acted upon without consideration, and there is relatively little inhibition.

Although he has no definite evidence to produce, the author expresses his belief that the milder mental disturbances, grouped as the psychoneuroses, do not occur in the aboriginal, as he rightly says these are disorders arising from the subjective conflicts which occur in consequence of the finer shades of affective reactions which we experience as a result of our upbringing under the complex civilization in which we live, and such finer conflicts do not exist for the native. His life is regulated by strict tabu on the one hand and stern necessity on the other, doubt does not affect him, nor can he question his own subjective atttitudes.

Dr. Bostock concludes that :—

There is evidence that the aboriginal shows the following characteristics in his insanities :—

(1) An early onset of dementia, with .tendencies to motor responses and to visual rather than to auditory hallucinosis.

(2) The paranoid types are not represented.

(3) Dementia Praecox and Manic-depressive insanities occur.

(4) Epilepsy is probably more frequent in those in contact with European civilisation and may be a factor in the racial extinction.

(5) Confusional insanity and that associated with senile changes differ remarkably little from similar conditions in the whites.

(6) General paralysis of the insane is not infrequent and exhibits the demented form.

(7) The aboriginal has not reached an evolutional stage in which the neuroses and certain of the psycho-neuroses, hysteria and the phobias can exist.

Thomas Beaton.

SUNDSTROEM (E. S.). **A Summary of Some Studies in Tropical Acclimatisation. (Preliminary Communication.)**—*Commonwealth of Australia Dept. of Health Service Publication (Tropical Division).* No. 6. 32 pp.

Dr. Sundstroem appears to have been recently appointed to the Australian Institute of Tropical Medicine at Townsville, Queensland, and his paper appears to be addressed to his fellow-citizens not so much as a record of past work but as an earnest of his good intentions. He treats of a number of topics, and indicates what has to be done. On many questions, the data presented are scanty, the subjects of his observations being few and in many cases limited to one or two persons, often only to himself. But he is evidently industrious, and full of ideas, and one looks forward to fuller papers of which the present is only preliminary.

The important problem of basal metabolism is in the forefront, and so far as his observations go he agrees with DE ALMEIDA that this is reduced in hot climates, but this does not mean that vitality is lower, for his " reaction times " were shorter, and his energy-output at the normal level. There is no diabetic tendency observable and the blood shows an alkalotic tendency, which, however, can be combated by physical work and copious water drinking. There are many blood analyses, but the point to which the author attaches most importance is the low lipoid (especially phosphatide) content, and he suspected that reduced growth in certain schoolchildren might be correlated with this factor, but found no evidence of this in the 15 girls he examined. There is a drop in the white (especially polynuclear) leucocytes, and a number of more or less isolated facts in blood chemistry and morphology are set forth, but one awaits fuller consideration of these until more observations are to hand. No retarding effect of a hot climate (*per se*) on growth of children was found. The paper concludes with remarks on housing conditions (one house only was studied), diet (reduction of protein intake) and other means of improving tropical environment, somewhat discursively treated but with the idea of presenting points for further research.

W. D. Halliburton.

KNIPPING (H. W.). **Ueber die Analyse und therapeutische Bedeutung des tropischen Lichtklimas.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. pp. 269–280. With 1 fig. [19 refs.]

The therapeutic use of light is full of promise in many diseases, and although good results are reported, much better ones may be anticipated the more precise the methods become. Though the rays with short wave lengths (ultra-violet) are credited with the healing power, their relative amount in sunlight in different places and various times of day must be more accurately measured. The present paper describes a comparatively simple method (photo-electric) for their exact estimation in the tropics.

W. D. Halliburton.

BOECKER (Eduard). **Beiträge zur Pharmakologie der Chinaalkaloide, X. Mitteilung.**—*Ztschr. f. Hyg.- u. Infektionskr.* 1924. May 28. Vol. 102. No. 3-4. pp. 477-481. [5 refs.]

The author finds that vuzin (octylhydrocupreine) and eucupin are well absorbed but more slowly than quinine if given by mouth in man, and that a small quantity passes into the urine within 24-48 hours (1·7 per cent. for vuzin, 3·2 for eucupin). The formed elements of the body have evidently greater affinity for the higher homologues. Eucupin, more of which is excreted, is *in vitro* not so firmly united to the red corpuscles as vuzin. Eucupin, like quinine and morphine, if given subcutaneously is partly excreted into the stomach, from which it is reabsorbed by the intestine. This was analytically proved for guineapigs (two experiments), but the figures are smaller than for quinine. No such finding occurred with vuzin.

W. D. Halliburton.

HARDIKAR (S. W.). **The Action of Quinine on Protein Metabolism, Respiratory Exchange, and Heat Function.** [Abstract.]—*Brit. Med. Jl.* 1924. June 28. pp. 1125-1127. [18 refs.]

This is an abstract of a forthcoming paper containing the complete details. In a critical survey of the literature of the subject and by experimental observations of laboratory animals and human subjects the author examines the reputed value of quinine in reducing body-temperature by diminishing protein metabolism (as measured by loss of nitrogen in urine) and by respiratory exchange, and comes to the conclusions that quinine does not differ in mode of action from other antipyretic drugs ; that it has no action on protein metabolism in health ; that it does not reduce the gaseous exchange and heat production, except in a small proportion of fever cases, and then only for less than a few hours when given in maximum pharmacopoeial doses ; and, finally, that it is not possible in non-malarial fevers to control tissue-waste and to husband energy by means of quinine.

A. A.

McCRACKEN (J. C.). **Rupture of the Spleen. Report of Twenty Cases Observed in China.**—*China. Med. Jl.* 1924. June. Vol. 38. No. 6. pp. 437—451.

The cases reported came under treatment in St. Luke's Hospital, Shanghai, between November, 1917, and August, 1922. In every instance the condition was the result of injury. No case of spontaneous rupture has been seen by the author or his colleagues. Outside Shanghai, moreover, five of the most active surgeons in different sections of

China report, in answer to a questionnaire, that no case of rupture of the spleen either accidental or spontaneous has come to their notice, in spite of the fact that in many Chinese, for one reason or another, the spleen is very large. The author accounts for this by the increased frequency of serious injuries in places where conditions inseparable from modern industry prevail. [The fact that in large cities hospitals are usually within easy reach, whereas in rural districts the reverse often holds good, may also have some bearing on this point.] 30 per cent. of the cases were caused by tram or motor accidents, and 50 per cent. were the result of assault and battery, the cosmopolitan population of Shanghai being apparently prone to readily provoked and fiercely contested personal combats. The patients were all young, the average age being twenty-four.

50 per cent. of the total became unconscious at the time of injury and remained so for periods varying from a few minutes to several hours. Pain radiating to the left shoulder, a symptom mentioned by some writers, was not observed. In all cases operated on the spleen was found to be enlarged, in two the malaria parasite was discovered, in a large percentage there was a history of antecedent malaria.

At first it was the custom to operate immediately, but it was observed that some of those who declined operation recovered without it. Latterly cases presenting symptoms of shock were allowed a period of rest for reaction to set in, and others with symptoms less pronounced, but still those of rupture of the spleen, were treated on expectant lines. With a falling blood pressure, decreasing haemoglobin, and increasing thirst with or without dullness in the flanks operation is strongly advised.

Three of the twenty cases refused operation, one being removed from Hospital before treatment of any kind could be applied, another succumbing rapidly to the effects of the injury, and the third recovering and leaving hospital on the sixteenth day. In ten instances splenectomy was performed, with a mortality of 40 per cent. In two others the abdomen was opened but removal of the spleen was not attempted, bleeding having ceased in one and dense adhesions being discovered in the second, the former died of general peritonitis in the course of a week, whilst in the latter the rupture was packed with gauze and the patient was up and about four weeks later with a clean but not completely healed wound. In three cases patients recovered without surgical intervention, and in none of them does the diagnosis appear to have been in doubt. Two others died before any operation had been performed, the symptoms in one developing some hours after out-door treatment for wounds of the head, and grave complicating internal injuries hastening the end in the second.

Full details of cases are given. The author notes that for splenectomy a left rectus incision will usually suffice, and that great care is necessary to avoid injury to the tail of the pancreas in the course of the operation.

J. J. Pratt.

VAN ANDEL (M. A.). **Willem Piso, een baanbreker der tropische geneeskunde.** [Piso, a Pioneer of Tropical Medicine.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Oct. 4. Vol. 68. (2nd Half.) No. 14. pp. 1731–1746. With 3 figs. [8 refs.]

This is a short article reminding the modern student of tropical medicine of his debts to one long dead—though assuredly not forgotten.

It contains no new information concerning PISO, but deserves notice because it is written accurately and pleasantly.

PISO (1611–1678), as is well known, went to Brazil in 1636, as physician to Count JOAN MAURICE of NASSAU [cousin of the Prince of Orange], and remained with him there during the eight precarious years of his governorship of the Dutch settlement. [Those who know anything of the history of the Dutch West India Company—confessedly a buccaneering enterprise—and of the Spanish and Portuguese colonization of Brazil, will not need to be reminded of the difficulties under which PISO did his work.] Returning to Holland, PISO published in 1648 his famous *Natural History of Brazil*—a Latin folio, copiously adorned with coloured engravings, which contains the fruits of his own labours and those of his colleague MARCGRAF (1610–1644). This volume served, for many a long year, as the standard compendium of medical, zoological, and botanical information concerning South America. A second edition, enriched with the observations of BONTIUS in the East, appeared in 1658 with the title *The Natural and Medical History of Both the Indias* [*i.e.*, East and West Indies].

The work of PISO and MARCGRAF contains early descriptions of many things interesting to students of Tropical Medicine—including an account of the jigger (*Dermatophilus penetrans*), a description of the ipecacuanha plant (*Cephaelis ipecacuanha*) and its therapeutic value and use in dysentery, and a classical reference to yaws. [All these had, however, been noted by earlier travellers.] The present article is illustrated with reproductions of the title-pages of PISO's two works and his picture of the ipecacuanha plant.

[To the reviewer—who has no wish to deprive the Dutch of a pair of national heroes—it seems desirable to add (as Dr. van Andel fails to do so) that PISO, though born at Leyden, was of French origin, and MARCGRAF a German born.]

Clifford Dobell.

UNITED FRUIT COMPANY. **Medical Department. Twelfth Annual Report.** [DEEKS (W. E.), General Manager.]—180 pp. With 5 plates & 1 map. 1923.

The United Fruit Company in the years 1920–23 had an average number of 44,625 employees, and conducted its operations in Cuba, Jamaica, British Honduras, Honduras, Guatemala, Costa Rica, Panama and Colombia, in which countries its plantations cover an area of 685 square miles. It employs no less than 52 doctors. From its last annual report, which is full of interesting matter, a few extracts are here made.

Among approximately 2,000 employees from northern climates in the year under review there were only 4 deaths from conditions attributable to residence in the tropics, 2 from bacillary dysentery and 2 from blackwater fever, and the last two patients were labourers who paid little attention to hygiene.

About 2 per 1,000 employees were repatriated during the year, practically all labourers from Central American countries ; the diseases chiefly responsible were : tuberculosis, 25 per cent. · chronic nephritis, 11 per cent. ; beriberi, 9 per cent. The following table affords a comparison [which in the absence of age data must not be pressed] between the diseases which kill in Central and North America respectively:—

Disease.	Northern Communities.	United Fruit Company's Divisions (1923).
Typhoid fever	·7	1·0
Influenza and pneumonia	11·5	22·6
Tuberculosis—all forms	12·8	9·0
Cancer—all forms	8·8	1·4
Cerebral hemorrhage—apoplexy	6·8	·8
Diseases of the heart	12·7	5·1
Chronic nephritis	7·0	5·6
Puerperal state	1·7	1·7
Total external causes	11·8	8·2
*All other causes of death	26·2	44·6
	100·0	100·0

*Details of " All other causes of death " :—

Malaria	—	13·4
Diarrhoea and enteritis	--	3·0
Other diseases of the digestive system ...	—	3·2
Diseases of early infancy	—	2·3
Dysentery	—	7·3
Others	—	15·1

The Company's figures in this table approximate closely to those of the preceding 9 years.

As to morbidity, malaria was responsible for 38 per cent. of admissions to hospital during the year; and next in prevalence came venereal diseases, ancylostomiasis, and dysentery in that order.

Malaria is discussed at considerable length. A questionnaire on the details of treatment sent to the members of the medical staff elicited a variety of opinions. Dr. Deeks stresses the fact, perhaps insufficiently recognized, that it is impossible by any known means to cure malaria absolutely in an individual who is suffering from some other complicating or debilitating conditions such as syphilis, hookworm disease or malnutrition.

Dr. BARBER has made a recent malarial survey of the plantations of Honduras and Guatemala and finds that the Anopheles index is comparatively low. The malaria index, however, is high, probably over 30 per cent. infected, so that it is necessary to limit the number of carriers by some form of quinine treatment. In the treatment of amoebic dysentery, concurrently with emetine, bismuth subnitrate is given " a heaping teaspoonful dose every 3 or 4 hours, mechanically stirred in a tumbler of plain or aerated water," continued till the stools begin to form. Relapses are said to be rare. It is suggested that the bismuth forms a chemical combination with the nascent sulphur of the bowel contents and that free sulphur is necessary to the development of the entamoeba.

Dr. H. C. CLARK, of the Tela Hospital Laboratory (Honduras) examined for malaria 3,200 of the Tela Railway Company employees and found over 30 per cent. positive. Three other surveys were made, with the following results :—

SUMMARY OF SURVEYS.
(Incidence of malaria, by four methods.)

	Per cent.
Autopsies (acute and latent cases) (60 examined) ..	41·6
Hospital admissions (3,264)	31·5
Labour camps, schools, etc. (534 persons)	26·2
Placental films examined (44 cases)	18·1

The same author's " survey at Tela Hospital to determine syphilis " is noticed elsewhere.

A. G. B.

HOFFMANN (W. H.). **New Experiences on the Laboratory Diagnosis of Smallpox and their Practical Importance for the Sanitary Service.** —*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 528–537.

The methods recommended are PAUL's method and the blood count, already described in this *Bulletin* (Vol. 21, pp. 330–4).

A. G. B.

REVIEWS AND NOTICES.

NEWSTEAD (R.) [F.R.S.], with the collaboration of EVANS (Alwen M.) & POTTS (W. H.). Foreword by STEPHENS (J. W. W.). **Guide to the Study of Tsetse-Flies.**—*Liverpool School of Tropical Medicine. Memoir (New Series) No. 1.* 1924. pp. xi+332. With 3 coloured and 25 plain plates, 4 maps & 59 text figs. University Press of Liverpool, Ltd., Hodder & Stoughton, Ltd., London. [Price 20s.]

Except in its taxonomic principles and procedure, this book is modelled on familar lines. It deals comprehensively with the tsetse-flies as such, their anatomical and physiological peculiarities, their environment and their manner of adaptation to it in all stages of their existence, the different specific forms in which they are known, and the characters and the environmental particularities by which these different species are distinguished. Although, of course, it also takes due cognizance of their particular pathogenic relations, it does not wander upon the ocean of trypanosomiasis, nor into the stormy waters of tsetse-fly control, but keeps with admirable rectitude on the set course of pure entomology.

The first 42 pages are occupied by generalities—the pathogenic import of tsetse-flies, their life-cycle and peculiarities of reproduction, the egg, the larva and its modifications for intra-uterine development, the pupa, the adult characters, the structural details of the proboscis and genitalia, the main features of the alimentary tract. Everything here is very clear and full, though more notice might have been taken of the antennal sensory organ, an object so worthy of comparative study, and—as another purely entomological point--the comparative study of the breathing-organs of the larva might, perhaps, have included some reference to those of the larva of some of the Oestrids.

The classification of the tsetse-flies, which follows, is based upon the characters of the genitalia— an anatomical basis first expounded by the senior author. This basis, though not the most convenient for the medical man—since it necessitates more familiarity with insect anatomy than he has need of, and more technical manipulation of specimens than he, perhaps, has time for—is in itself unimpeachable. By the construction of their genitalia the species of Glossina are separated into three groups—typified severally by *fusca, palpalis, morsitans*—each of which, moreover, has its several superficial, corroborative distinctions more amenable to the inexpert eye. How much further we may safely go in discriminating specific types exclusively by their genitalia is a question to be asked. We can hardly assume that types of genitalia are of geometrical constancy in every little detail, or that trivial inconstancies in the component parts of a given structural plan bear exactly the same interpretation as large constructional differences of plan such as those that strike the eye in the three species named above.

The individual species are treated on a uniform plan which in every case includes the synonymy and documentary record (the latter probably not intended to be complete), the diagnosis and a succinct description, a detailed and illustrated description of the genitalia, and the geographical range; to this is added what is known of the life-cycle and bionomy. This last biological information is, for most of the species, necessarily lacunar, but in the case of those notoriously dangerous it is as full as possible and includes all the known and studied details of the life-history, reproductive life, and life-cycle, and the environmental influences—organic, meteorological, and seasonal—by which they are determined and affected. Valuable and interesting, and very often suggestive, this biological information indeed is, but in the main it is too copiously and diffusely stated to be easily apprehended and firmly locked in the memory.

The plates include excellent coloured figures and a profusion of anatomical illustrations by the accomplished senior author, a gallery of artistic pictures of the haunts and breeding-grounds of the flies, and some very clear and instructive distributional maps.

The volume is well got up and daintily apparelled.

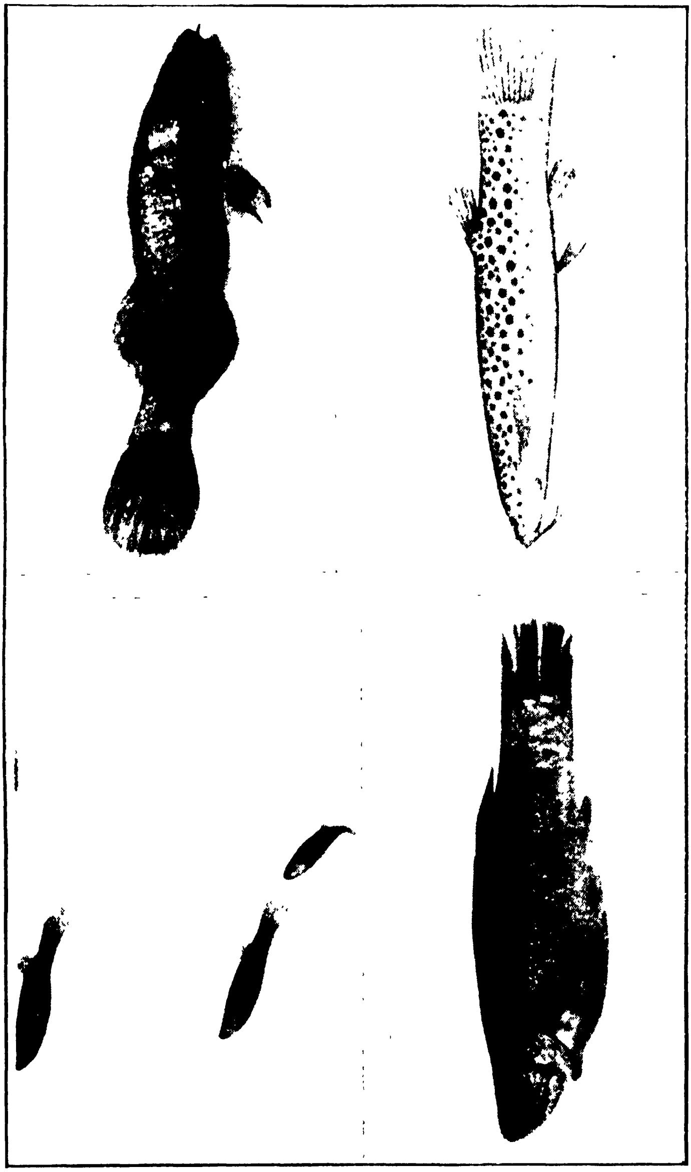
A. Alcock.

ROCKEFELLER FOUNDATION. **Annual Report for 1923.** [VINCENT (George E.), President.]—pp. xiii-389. With 79 figs. & 1 portrait. The Rockefeller Foundation: 61, Broadway, New York.

A bare catalogue of the undertakings initiated, or supported and aided by the munificence of the Rockefeller Foundation, in the year 1923, has appeared in this *Bulletin* (Vol. 21, p. 764). That was quoted from the President's Review; it now remains to take the wings of the morning and fly to the uttermost parts of the sea in a rapid survey of those world-wide benefactions as they are mirrored in the official reports of the International Health Board, the China Medical Board, and the Division of Medical Education.

To take Medical Education first. All three branches, preliminary, scientific, undergraduate, and post-graduate in all its ramifications, have been impartially developed or sustained in many countries according to their respective individual needs. Apart from bountiful assistance to institutions in the United States and in China (see below), large grants were made to the medical schools of three universities in Canada and one in Brazil, and final payments to complete the fine Institute of Anatomy presented to University College in London. "Either directly or through other agencies [the Foundation] provided fellowships for 636 men and women who were preparing for teaching or administration" in various branches of medicine, public health, and ancillary sciences—travelling and resident fellowships, impartially cosmopolitan and international in allotment and tenure. We may follow the course of a graduate holding one type of fellowship in public health. All arrangements are made for his passage from his own country to New York, where he is met and provided for; and a programme of studies is arranged, which includes an academic course in the Johns Hopkins School of Hygiene and practical experience of various branches of service in city and county. Thus promising individuals are being trained for specific service in their own countries; and there are other types of fellowships. The Division of Medical Education also afforded emergency assistance abroad in the form of literature, laboratory supplies, and local fellowships, besides maintaining a wide-spread general survey and advisory service. The disbursements for the year, on account of medical education (U.S.A. and China included) amounted to close upon five million dollars (p. 65).

The multifarious activities of the International Health Board have ranged from America round to Australia. They include the developing of rural sanitation and organization of Public Health in New Brunswick, the southern U.S.A., Brazil, Czechoslovakia, and the Philippines; assistance or co-operation, in varying degrees, in hookworm control in North, South and Central America and the West Indies, Mauritius, Ceylon, Siam, the Philippines and Australia; assistance in malaria prevention in the southern U.S.A., Nicaragua, Rio de Janeiro, Palestine, and the Philippines; aid and co-operation in the organization of Public Health Nursing Services in Brazil, France, and the Philippines; assistance in the establishment of laboratories in several countries east and west, and to Public Health education in São Paulo, Prague, and Warsaw; and generous co-operation with the League of Nations in the development of an international health organization and international interchanges of public health personnel. Furthermore, systematic operations against yellow-fever were continued in Mexico, Colombia, and the east coast of Brazil, and it is believed that now "the liberation of the Americas from the menace of yellow fever is a goal at last within sight." In the extermination of the yellow fever mosquito, which breeds so largely in domestic receptacles, little fishes were of the greatest service. The expenditure of the International Health Board for the year amounted to 3,174,268 dollars (p. 64).



Four of the most useful fish for the control of mosquito breeding. Top: left, *Gambusia affinis*, the best known of the top-minnows; right, *Dormitator latifrons* or *chalaco*. Bottom, left, *Fundulus heteroclitus*, or barred killifish; right, *Pygidium piurae* E., popularly known in South America as "lite" (pronounced lefa). [Reproduced from the *Annual Report of the Rockefeller Foundation for* 1923.]

The engagements of the China Medical Board were chiefly in continuation of established projects, particularly medical education and—equally important in the East—the preliminary scientific education. At the Peking Union Medical College and Hospital, which is the principal recipient of the Board's assistance, the number of undergraduate students during the year was 53—with 56 at the adjunct Pre-medical School, and 16 at the associated Nursing School; graduate courses in various subjects were also maintained; and special funds were provided for a field study of kala azar, 5,000 treatments of which disease were carried out at the hospital during the first half of the year. At the hospital 213 beds were maintained, and 3,403 in-patients and 77,301 out-patients were treated. The inveterate antipathy of the Chinese to post-mortem investigation has still to be surmounted. Large assistance was given to the now incorporated and united medical school of Tsinan and women's medical college of Peking; the number of students was 96. The usual annual subsidy was paid to the Hunan Yale College of Medicine (41 students). Towards preliminary scientific education further grants to the extent of more than 300,000 dollars were made, or promised, for the construction of buildings and laboratories at numerous established schools and universities. A necessary atmosphere for medical education has still, however, to be created in China, and to this end a grant has been made towards a campaign of suggestion among the academic youth, and the apparatus for lively lectures on public health has been distributed. The adaptation of the vernacular to accurate translation of medical literature is another necessity towards which temporary contributions are continued. Finally, provision was made for the temporary maintenance of an architectural bureau to give advisory assistance to hospitals, medical colleges and other such institutions in China contemplating additions or improvements to their buildings.

Of the details of the Treasurer's Report one can only say, in the language of Rosencranz, that they strike the reader with amazement and admiration.

A. Alcock.

Ceylon. Its History, People, Commerce, Industries and Resources. With a Foreword by the Hon. Mr. Cecil CLEMENTI, C.M.G. (Colonial Secretary, Ceylon).--pp. xxxvi+207+119+125. With 1 map & numerous illustrations. Compiled and published by **Plâte, Ltd.**, Colombo. [Price Rs. 5s.]

Except for one astonishing omission this little gazetteer of Ceylon is a useful and artistic piece of work. In a minimum of words it gives an excellent impression of the natural features of the island, sketches its history, laws, political institutions, and educational advances, and describes its public works and buildings, its agriculture and fisheries, its industries of every kind, and its objects of particular natural and historic interest. Withal it is so well illustrated that in some chapters we can almost scent the soft-blowing spicy breezes—the " ever gently breathing gales of zephyr, Oceanus sends up to gladden man." But in a short chapter on " Population " we learn that even in this rich and beautiful island the curst fiend Care " climbs the bark and trims the sail." In a population (1921) of over 4,500,000, during the last decade the annual average death-rate was 30 per mille (30·6 in 1923), and the annual average infantile mortality 193 per 1,000 births, and in 1923 the standardized urban death-rate ranged from 19·8 to 72·5 per mille. When now we look for some account of the prevalent causes of these high death-rates and of the medical and sanitary institutions for preventing them we can find nothing. In a Who's Who appendix we do indeed see the names and styles—and in some instances the counterfeit presentments—of the local medical practitioners; but *nothing* is there said of their public work, or of the institutions where that work is carried on. Surely we may ask—more in sorrow than in anger—Is not this an astonishing omission for the beginning of the second century after Pasteur?

A. Alcock.

MENSE (Carl). **Handbuch der Tropenkrankheiten. 3te Auflage. Band 2.**—pp. xiii+1019. With 18 plates & 306 figs. 1924. Leipzig: Verlag von Johann Ambrosius Barth. [Price G. M. 66 unbound, 70 bound.]

Lepra (von Prof. Dr. Georg STICKER). Maltafieber oder Mittelmeerfieber (von Prof. Dr. med. Martin MAYER). Cholera asiatica (von Prof. Dr. Paul KRAUSE). Psittakosis (von Prof. Dr. Filippo RHO). Die Pest (von Prof. Dr. P. C. FLU). Die Tsutsugamushi-Krankheit (von Prof. Dr. M. MIYAJIMA). Die Spru (Tropische Aphthen) (von Prof. Dr. Hermann DOLD). Beriberi (von Prof. Dr. Bernhard NOCHT). Die tropischen Hautkrankheiten (von Prof. Dr. Albert PLEHN & Dr. Karl MENSE jun.). Die tropischen Intoxikationskrankheiten I. (von Prof. Dr. Filippo RHO). Die tropischen Intoxikationskrankheiten II. (von Prof. Dr. Edwin Stanton FAUST).

As a result of the war, the present edition of this well-known text-book suffers from the inability of the writers of the various articles to acquaint themselves sufficiently with the work done by those of other, often enemy, nations in the same field. Much use is indeed made of the experience of German army doctors, but, although lengthy bibliographies are supplied, the text contains scanty or no references to the numerous recent publications by the medical officers of other nationalities. Several of the articles appear in almost the same form as in previous editions.

Unstinted praise must be given to the chapter on leprosy by Dr. Georg STICKER. This contains an especially interesting section on the history of the disease, and an excellent account of its pathology and symptoms. The author shows a judicious caution about the results of treatment.

In Professor Paul KRAUSE's article on cholera the bacteriology and pathology are presented in masterly fashion, but the discussion of the treatment of the disease seems scarcely adequate.

Professor P. C. FLU is responsible for the account of plague; the sections on epidemiology, and on the relations between rats, fleas and man, are worthy of the author's reputation. The numerous references to work done in the Java epidemic are of much value.

Tsutsugamushi disease is in the competent hands of Professor M. MIYAJIMA, and Professor Hermann DOLD gives an attractive account of the aetiology and theories as to the nature of sprue. Numerous forms of skin diseases seen in the Tropics are described, but nearly all the articles are too short, and not sufficiently critical, to be of much practical value.

More than one hundred pages are assigned to the poisonous plants and animals of warm countries; the section on snake venoms can scarcely be considered to represent adequately modern knowledge of the subject.

The illustrations are mostly reproductions of photographs; while some are satisfactory enough, there are many diseases which do not lend themselves to this method of graphic representation.

"Handbuch" seems a more than usually inappropriate word in the case of a work in six volumes, of which the one under review, unbound, weighs six pounds.

H. J. Walton.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

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MEDICAL HELMINTHOLOGY: A REVIEW.—(PART III).*

By R. T. LEIPER, M.D., D.SC., F.R.S.
Sectional Editor, Tropical Diseases Bureau.

NEMATODA.

Introductory.

Since the commencement of the *Bulletin* in 1912 the most important contributions to our knowledge of the parasitic nematodes of man have concerned their life-histories and bionomics rather than their morphology, *e.g.*, the elucidation by STEWART of the cycle of migration of the larval *Ascaris lumbricoides* through the liver and lungs after hatching of the egg in the stomach of the definitive host; the implication of certain species of Chrysops in the transmission of *Loa loa*; and the demonstration that the guineaworm is limited in its spread in tropical countries not merely by temperature and water conditions but by the capacity of certain species only of Cyclops to act as efficient intermediaries. Of great practical value as well as theoretically interesting are the researches which have followed BAERMANN'S pioneer work on the migration of the free-living larvae of hookworm in the soil. There have been many changes on the nomenclatural side, but these do not call for special comment, for such changes naturally follow upon a better understanding of the morphology of the parasites and their relationships. Those interested in the attempts to secure stability should compare the correct names as determined by Clayton LANE in 1916 and those now in use.

On the morphological side the number of papers dealing with the structure of the adult nematodes is surprisingly small. The detailed study of the morphology of the single species *Ancylostoma duodenale* by Looss (1905) remains a model which no one has attempted to emulate.

A certain number of new nematodes have been added to the list of those infecting man, viz., an eyeworm—*Thelazia callipaeda*, and two larval skinworms *Agamofilaria georgiana* Stiles, and *Agamofilaria streptocerca* (Macfie). In South America, a microfilaria has received a special name, *M. tucumani*, while in the Pacific Islands the

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* For Part I (TREMATODA) *see* Vol. 19, pp. 361–365, and Vol. 20, pp. 857–864
For Part II (CESTODA) *see* Vol. 20, pp. 85–91.

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microfilaria without nocturnal periodicity has been called *M. philippinensis.* In North America WARD has recently reported a *Gongylonema* from man, while in Europe SAMBON (1924) has determined from an examination of the original illustration of the old *Filaria labialis* Pane (1864) that this worm belongs to the same genus. A female, apparently of a new species, has been named *Loa extraocularis* by SKRJABIN, though it does not appear to belong to this genus. The routine examination of the faeces of large numbers of persons during hookworm campaigns and in recruitments for war service has brought to light many interesting facts concerning the incidence of helminth infestation—incidentally it has revealed the accidental infection of man with the *Oxyuris tetraptera* of the mouse. "*Oxyuris incognita*" n.sp. identified on the egg found in faeces was for several years a puzzle to parasitologists, but has lately proved to be an egg of a common nematode infesting food plants!

Ascaris lumbricoides.

The starting point in modern advances concerning the life history of *Ascaris lumbricoides* is to be found in the preliminary note on STEWART'S investigations (1916) published in the *British Medical Journal,* 1st July, 1916, when he shewed, for the first time, that the embryos are liberated from ripe eggs when these are fed to rats and mice and migrate into the blood vessels of the liver, spleen and lungs during the succeeding four to six days. Between the sixth and twelfth day the young ascaris larvae passing into the airsacs cause haemorrhage and may actually cause the death of the host from the resulting pneumonia. If the animal recovers, the larvae are then found to have reached the intestine *viâ* the trachea and oesophagus. His later experiments (1916–1917) showed that after reaching the intestine the worms tend to be passed in the faeces, and the difficulty of inducing in young pigs an infestation with adult worms at first appeared to confirm STEWART in his early view that the rat or mice played an essential rôle as intermediate hosts. RANSOM and FOSTER (1917) repeated and confirmed STEWART'S facts, but, like all other authorities, believed that his hypothesis was fallacious and that under proper experimental conditions it would be found that development was direct and did not require an intermediate host. In their view age was an important factor in determining susceptibility of the host. The pneumonia following the pulmonary invasion with larval ascaris observed by STEWART in his experimental work is now recognized as a common symptom in young pigs and in young children. In Japan YOSHIDA (1918) had apparently been working on similar lines, for shortly after STEWART'S first communication this author published a series of observations on the results of feeding guineapigs with embryonated ascaris eggs. He came to the conclusion that the human ascaris eggs did not require an intermediate host but that the migration through the lung resulted in developmental changes which were an essential preliminary to the development of adult forms in the intestine. Having swallowed larvae from the lung of a guineapig without result this worker later swallowed larvae of larger size taken from the trachea of a guineapig and obtained evidence of success 75 days later from the presence of eggs in faeces. Meanwhile STEWART had continued to experiment with three-day old sucking-pigs and was led in 1920 to abandon his intermediate host theory. In 1921 FÜLLEBORN published the results of characteristically careful studies in which he traced the passage of the larvae *viâ* the hepatic portals and hepatic veins to the lung. He shewed that the larvae could traverse the capillaries and were to be found in the kidneys, brain and placenta, and might even give rise to intrauterine infection. YOSHIDA, on the other hand, formulated the view that the larvae reached the lung from the abdominal cavity by piercing the diaphragm. This was not upheld by the more recent work of RANSOM and CRAM (1921) or NETTESHEIM (1922). The pathological changes in experimental animals were studied by MATSUBARA (1923), YOKOGAWA (1923). A large number of interesting clinical and pathological reports on the rôle of ascaris in producing various surgical involvements have been reported. These have recently been summarized, unfortunately without bibliographical references, by LE ROY DES BARRES (1924).

Many efforts have been made to induce hatching of embryonated ascaris eggs in artificial media, etc., but they have been almost uniformly negative. KONDO (1920) reports, however, the natural hatching of embryos in culture with animal charcoal. The embryos hatched after seventy days from the commencement of the culture and when smeared on the skin of young guineapigs successfully attacked the host and were afterwards found in the lung and liver. Other workers, YOSHIDA, etc., have successfully induced pulmonary invasion by subcutaneously inoculating embryonated eggs. In 1922 RANSOM gave a valuable review of the recent addition to our knowledge of the subject and discussed in detail the important public health problem of the relation of the ascariasis of the pig to that of man. KOINO reported two parallel experiments of infection of man with embryonated eggs from ascaris in man and pig. In both there was pulmonary migration but in the experimental infection with eggs from the pig the symptoms were slight and no adults resulted, whereas in the experiment with eggs from a human case the symptoms were very serious and fifty days after the test 667 immature worms were expelled by anthelmintics. The conclusion accepted at the moment by most workers is that the *Ascaris lumbricoides* of man and that of the pig are distinct biological strains. We shall see later that a similar conclusion has been formed regarding *Necator americanus*, just as recent work on *Hymenolepis nana* tends to lead in the same direction. OHBA (1923) and other Japanese workers have devoted much attention to the conditions under which ascaris eggs survive outside the body. Apparently the eggs cannot withstand actual desiccation but the albuminous envelope and thick shell resist in a remarkable fashion penetration by most fluids, including formalin, alcohol, lysol, etc.

Lagochilascaris minor.

The normal host of this intestinal worm is undetermined. It was first described from subcutaneous abscesses in a native of Trinidad (LEIPER 1910). A second and remarkable case has been noted in Dutch Guiana. The specimens were recovered from a mastoid abscess during operation, and were afterwards identified by LEIPER at the London School of Tropical Medicine (ORTLEPP 1924).

Dracunculus medinensis.

Guineaworm disease is peculiarly patchy in its distribution in tropical countries. It prevails chiefly in those parts where the water supply is scanty and where during the dry season the native population is forced to rely upon wells and small collections of water. Prevention of guineaworm depends upon the adequate protection from infection of these sources of supply, by provision of pumps and of parapets, and for the exclusion of surface water. Little so far has been done to put into practice the sterilization of already infected wells. In 1911 LEIPER pointed out that a slight rise of temperature, to say 35° C., resulted in the death of cyclops and suggested that if such means were used during the dry season infected wells might be sterilized at slight cost. Following upon this suggestion for the use of heat, the impracticable suggestion has been put forward that the temperature might be raised by the addition of quicklime. ALCOCK (1912) recommended the addition of one pound of KOH to every 180 gallons of water, as a solution of 0·07 per cent. of caustic potash proves fatal to cyclops in from 2–10 minutes.

ROUBAUD (1913) experimentally confirmed LEIPER'S view that the guineaworm does not infect cyclops by actively penetrating their bodies, but as a result of ingestion. Later work by CHATTON (1918) has shewn that an important factor in the distribution of guineaworm is the susceptibility or otherwise of the local cyclops. Of four species collected in the Oasis of Gabes one, *C. macruris*, proved refractory to experimental infection, while the other three species were readily invaded by guineaworm larvae ; yet in none did metamorphosis occur even after 40 days. These observations were confirmed by ROUBAUD (1920) with local species of cyclops in Paris. In India TURKHUD (1914) set out the data available regarding the distribution of guineaworm in the Indian Peninsula and with Glen LISTON (1914) published an interesting study of the infestation of villagers and cyclops in an endemic focus. During an epidemic at Sarsola, 10 miles from Tahna, 10·78 per cent. of the inhabitants and 38·6 per cent. of the cyclops were found to be infected.

Various remedies have been advocated in the treatment of guineaworm. GUPTA (1917) reported on the value of iodine lotion in the treatment of abcesses; JEANSELME (1919), MONTPELLIER & ARDOIN considered as specific the injection of arsenobenzol; while Scott MACFIE (1920) and others have pronounced equally favourably upon the value of intravenous injections of tartar emetic. GREY (1920) reported good results from the injection of 0·15 gm. of novarsenobillon in 20 cc. distilled water. The most recent papers on this subject are somewhat contradictory. LE DENTU (1923) states that the drug, though not infallible, gave on the whole very encouraging results, whereas FAIRLEY (1924) after considerable experience in India has abandoned it as useless. A curious line of treatment is that advocated by RICHARDS (1922), whose patients were given a pound or more of raw Indian sugar daily while starving with only a sufficiency of water. In all cases the worm could easily be wound out unruptured on the third day. X-rays have proved with DELORT (1919) a useful means of identifying calcified guineaworms lying in the tissues. RAY (1920) has reported a case of guineaworm abscess in the inguinal canal which had been operated upon as an "inguinal hernia." For PEYROT (1923) a case of delusional insanity in a native soldier with guineaworm was the result of toxic psychosis.

Thelazia callipaeda.

Specimens of Filaria oculi were described from the conjunctival sac of Chinese by STUCKEY (1917) and TRIMBLE (1917). These have been identified by **Leiper** from the description and drawings as probably belonging to the species *Thelazia callipaeda*, a parasite common in the eyes of dogs in the Far East. **Fischer** (1919) examined specimens from Chinese dogs and arrived at the same conclusion.

Loa loa.

It is well known that infestation with this parasite may last for many years. **Begle** (1921) has reported a case in which embryos were found in the blood twelve to fifteen years after infection in Southern Nigeria. **Baumann** (1921) records the persistence of Calabar swellings for nine years. **Low** (1923) attributes the "Calabar swelling" to the death of the adult worm. Attempts to destroy the embryos in the blood with tartar emetic injections in dosage totalling 25 gr. have proved unsuccessful (**Low** & **O'Driscoll** 1921). For the intra-vitam differentiation of the embryos for staining, **Sharp** (1923) recommends methylene blue.

In 1913 **Leiper** announced his discovery of the intermediate host of *Loa loa*, having implicated experimentally two species of chrysops, viz., *Chrysops silacea* and *C. dimidiata*. These results were confirmed by **Connal** & **Connal** in 1921 (1921, 1923), who worked out the complete life-history and showed that the final stage of development reached the proboscis in twelve days.

Loa sp. dub.

A new species of the genus named *Loa extraocularis* has been described from man by **Skrjabin** (1917), but it does not possess the characteristic cuticular bosses and probably does not belong to this genus.

Onchocerca volvulus.

The chief points of interest regarding Onchocerca in man are the suggestion that this parasite may give rise to elephantiasis (**Ouzilleau** 1913 and 1923) and that it is the cause of filarial itch (**Montpellier** & **Lacroix** 1920–1921). The same species, or one closely allied, has been described by **Robles** (1919), **Calderon** (1920) and **Guerrero** (1922) as the cause of coast erysipelas in Guatemala. **Fülleborn** (1923) records the infection from Mexico. The Onchocerca embryos have been found by several workers [**Ouzilleau** (1912), **Fülleborn** & **Simon** (1913), **Montpellier** & **Lacroix** (1921)], but **Corson** (1922) failed to find a clear course of relationship between these larvae and the conditions of craw-craw, elephantiasis and lichenification. At Accra **Macfie** and **Corson** (1922) found the Onchocerca larvae in 34 per cent. of 50 healthy men, taken at random, in whom no tumours could be palpated. *O. volvulus* has a remarkably high incidence in the Belgian Congo. **Dubois** (1917) records 68 per cent. of infection with palpable nodules in adult natives in the Amadi-Suronga region. The parasite occasionally is the cause of abscess formation according to **Rodenwaldt** (1912), **Külz** and **Bach** (1913), **Fülleborn** (1913), and **Roubaud** and **Jamot** (1920). The new Microfilaria named by **Rodenwaldt** (1914) *Microfilaria nuda* is thought to be the embryo of *O. volvulus*.

Filaria bancrofti.

Two very important papers, dealing with the morphology and differential diagnosis of microfilariae, were published by **Fülleborn** in 1913–1914. In the latter year WISE and MINETT supplemented previous reports by WISE on the intimate association between *Filaria bancrofti* and deepseated abscesses and septic processes in the lymphatics of the thorax and abdomen. The importance of streptococcal infections in filarial disease was further elaborated by ROSE (1915 and 1919), and by ANDERSON and his colleagues (1922). ZIEMANN, working in New Guinea, dealt also with this etiological problem (1913). Many claims have been put forward in favour of the filaricidal action ot certain drugs, but none has been fully substantiated by later workers. BRANCH (1913) favoured salvarsan. ROGERS (1919 and 1920), ROY & BOSE (1922) tartar emetic, etc. ANDERSON, however, in 1922 made careful and detailed investigation of these substances reputed to be filaricidal, and reported that in no case could the drug be held to be lethal, although partial success was obtained with antimony compounds. On the statistical relationship between filarial incidence and filarial disease STEPHENS and YORKE (1920), STEPHENS (1921), BLACKLOCK (1922), CRUICKSHANK, CUNNINGHAM and IYER (1923), have made important contributions. Territorial studies on the incidence and pathological association of *Filaria bancrofti* have been carried out by BREINL (1912) in Queensland and more recently by CILENTO and RICHARDS (1924) for the whole of Australia. FÜLLEBORN (1912) dealt with the German South Sea Islands, and showed that the embryos found in the blood of natives of Bismarck archipelago, German New Guinea, Amboina and Celebes, had a nocturnal periodicity, whereas in Samoa and Fiji, Ponape and Yap, periodicity is irregular. BAHR (1912) has given a valuable account of the incidence, pathology and bionomics of filariasis in the Fiji Islands implicating the common mosquito of those parts *Stegomyia pseudoscutellaris* in the spread of the infection, and O'CONNOR (1923) has made a similar contribution to our knowledge of conditions in the Samoan Tokelau and Ellice groups of islands in the Western Pacific. As the result of the latter work, the breeding-places of this mosquito were discovered and preventive measures suggested. O'CONNOR'S research is noteworthy, moreover, on account of the remarkable series of statistical surveys made on the various islands visited. These are likely to prove ot value in coming years in determining the factors operating for or against the spread of the disease. In Cochin, CRUICKSHANK and WRIGHT showed that 20·9 per cent. of 1,000 cases had filarial embryos in the blood, 12·9 per cent. showed signs of elephantiasis, and 32·9 per cent. of the general population definite signs of filariasis. BAHR (1914) drew attention to the capricious character of the distribution of filariasis in the villages of Ceylon. JOHNSON (1915) found 19·25 per cent. of the inhabitants of the city of Charleston, South Carolina, harbouring filaria embryos in their blood. In the Argentine ROSENBUSCH (1916) observed that the embryos possessed no sheath, and neither showed periodicity nor gave rise to clinical signs. Earlier, a sheathed filaria, from this region, had been named *Microfilaria tucumani* and was reported by BIGLIERI (1923) as occurring in 43 out of 200 people. It was said to differ from *Microfilaria bancrofti* in absence of periodicity. TODD and WHITE (1917) drew attention to the remarkable localization of small endemic centres of filariasis and elephantiasis in the desert near Cairo. Preston MAXWELL (1921) reviewed the position of filariasis in China and FLU (1917–21) for the Dutch East Indies. The underlying cause of filarial periodicity has been the subject of many investigations and hypotheses. Yamada and Yamamoto (1916) and Wayakawa (1918) considered that the condition could be ascribed to oxygen chemotaxis. Yorke and Blacklock (1917) thought it dependent primarily upon periodic variations in the arterial supply of larvae to the cutaneous vessels. Lynch (1919) favoured a mechanical explanation and noted that in the collapsed lung of a dog infected with *Filaria immitis* the embryos accumulated in the lung in enormous number. Suganuma (1921) considered that the most important cause of periodicity was the strong negative heliotropism of the embryos.

Filaria conjunctivae.

Normally a parasite of the horse, several cases of this species in man have been recorded from Southern Europe. To these records there must be added recent cases by (*a*) Graham Forbes (1918) from soldiers in Macedonia, (*b*) Charles and Sewell (1920) from a native of the Sialkot district, near Jammu State, India, and (*c*) by Gupta (1921) from a Mohammedan who attended a clinic at Ramporehaut.

Agamomermis restiformis.

In 1880 Leidy described as *Filaria restiformis* a blood-red worm passed alive from the urethra of a labourer in West Virginia. Smith and Denney (1913) report a further case from North Carolina and express the opinion that these forms belong to the second larval stage of a species of *Mermis*.

Gongylonema hominis.

This tissue nematode, characterized by a series of large bosses of cuticle around the anterior end of the worm, has been recorded from man by Ward (1916) and by Stiles (1921). Whereas Ward was inclined to identify his specimen as the same as *G. pulchrum* from the pig, Stiles is of opinion that, on purely empirical grounds, both these specimens should be referred to a doubtful new species named *Gongylonema hominis.*

Habronema muscae.

In house-flies there are minute nematodes, named more than sixty years ago by Carter of Bombay *Filaria muscae.* In view of the public health importance of flies attention may here be drawn to the important work of Ransom (1913), which proved that the " Filaria muscae " is the larval stage in its intermediate host of *Spiroptera megastoma,* a nematode commonly parasitic in the stomach of horses. The eggs of the parasite passed in the faeces of the horse are consumed by the fly larvae and, after metamorphosis, these larval worms pass into the adult fly. The parasite of course is not a parasite of man.

Gnathostoma spinigerum.

Further cases of this aberrant parasite in man have been recorded by Leiper (1913) and Robert (1922) from Siam, by Samy (1918) from a Chinese coolie in the Malay Peninsula and by Tamura, Fujita and Ikegami (1919) from China and Japan. Robert makes the interesting statement that the parasite gives rise to migratory elastic oedema with painful irradiations and tends to escape from other surfaces as well as from the skin. He records a case in which one worm was discharged from the tongue and another from the pharynx, and believes that its migrations may also be responsible for haemoptysis, haematemesis and haematuria. The morphology of the type species has been fully described, and the systematic relationship of the genus discussed by BAYLIS and LANE (1920).

Physaloptera mordens.

This round worm, which is apt to be confused with small specimens of *Ascaris lumbricoides*, was first described from Uganda. Further records (LEIPER 1915) have extended its distribution to Nyasaland and Portuguese East Africa, where it appears to occur not infrequently.

Rhabditis spp.

FRANCAVIGLIA (1916–17) has recorded the occurrence of *Rhabditis pellio* in the alkaline urine of a patient with interstitial nephritis, but considered that the worm was only accidentally present. KOBAYASHI (1920) described and illustrated a minute adult to which he gave the name *Rhabditis hominis* and which he found in 17 of 668 pupils of primary schools in Japan. He is of opinion that several Japanese descriptions of *Strongyloides stercoralis* actually refer to infections with this new worm. WATANABE (1922) also recorded a case of Rhabditis infestation to which he gave the name *R. faecalis* n. sp. His paper is in Japanese and the English summary does not contain any specific description. In a previous paper TORII and WATANABE (1922) also refer to the occurrence of eggs of Rhabditis in faeces as a possible source of confusion with *Strongyloides intestinalis*.

Strongyloides intestinalis.

The metamorphosis of the embryo of Strongyloides directly into the infective stage and indirectly by the development of sexual adults has been studied by ROSSEAU (1921). He concludes that the direct method is normal and intrinsic and is not due in any way to the composition of the culture medium. An interesting case of haematuria accompanied by the passage of numerous filariaform larvae of *Strongyloides intestinalis* is recorded by FORNARA (1922). THIRA (1919) has made histological studies on the tissues infected with Strongyloides and OHIRA (1913) has dealt also with the question of its pathogenicity. BRAU (1913) considered that this parasite not only caused profound modification of the normal blood count, but accompanied progressive anaemia, gastro-intestinal dyspepsia, and chronic diarrhoea. BARLOW (1915) added neurasthenia to the special symptoms attributable to this parasite, while HEMSEN (1923) described one severe and one fatal case of anaemia in which this was the only recognizable cause of disease.

Syphacia obvelata.

This common parasite of mice and its characteristic banana-shaped eggs have been found in faeces from Zamboanga, Philippine Islands, by RILEY (1919).

Oxyuris incognita.

During the War the examination of a large number of recruits in America led to the recognition in the faeces of a new and apparently unknown egg, which, owing to its size and contour, being somewhat flattened on one side, was identified by KOFOID and WHITE as probably a new species of Oxyuris which they provisionally named *O. incognita.*

During the hookworm campaign in Australia, also, this egg frequently appeared. It has recently been identified by SANDGROUND (1923) as the egg of *Heterodera radicicola,* a common parasite of food plants. It occurs therefore merely as a foreign body in human faeces.

Oxyuris vermicularis.

Mrs. PHILPOT (1924) and Japanese workers have re-studied the development of *Oxyuris vermicularis* and have concluded that development within the bowel is direct from embryonated eggs which have been swallowed. There is no migration through the lungs corresponding to that recorded for *Ascaris lumbricoides.* In her studies of the eggs of Oxyuris Mrs. PHILPOT has drawn attention to a hitherto unnoticed " emergence area " in the egg shell. Several papers have been written on the pathogenicity of Oxyuris. INNIS and CAMPBELL (1914), WOOD (1918), CHASSOT (1920) and EASTWOOD (1923) deal with the clinical condition sometimes known as "Appendicopathia oxyurica." Various substances have been recommended to replace santonin in the treatment of oxyuriasis, viz., salvarsan by HAJOS (1922), fresh blueberries by NYBERG (1923), aluminium subacetate by SCHMIDT (1922), while numerous papers have been published during recent years on a German proprietary treatment.

Trichuris trichiura.

The early phases in the life-history of this parasite have been studied by FÜLLEBORN (1923). Development evidently takes place as in Oxyuris without invasion of the vascular system. RODRIGUEZ-ARJONA (1915) calls attention to a severe type of chronic enteritis attributable to the whipworm. DA SILVA (1916) records cases of hyperemesis due apparently to the same cause, while numerous authors have written on the relationship between the whipworm and appendicitis. Of these may be noted SUZUKI (1916), DA MATTA (1917), and SANDERSVILLE (1920).

STRONG (1918) considers that the whipworm can give rise to severe anaemia, dirt eating, etc., constant eosinophilia and lymphadenopathy and that the symptoms and signs in this infection are practically identical with those of hookworm. POPOWSKI (1921) has shown that blood tests on faeces were positive in a considerable percentage of cases of infestation with whip-worm.

Trichinella spiralis.

RANSOM (1916) and RANSOM, SCHWARTZ & RAFFENSBERGER (1920) have shown that after 14 days of exposure to a low temperature, *e.g.*, 10° F., trichinous meat is markedly affected. If refrigerated at not higher than 5° F. for not less than 20 days, there should be little danger of infection. The temperatures used in smoking and pale drying are too slight to injure the parasites seriously, but the combined action of salt and temperature destroyed their vitality. Drying played a decided part in bringing about the destruction of the trichinae.

Haemonchus contortus.

In 1908 MAGALHAES recorded the presence in man in Brazil of this common parasite of sheep. This remained the sole record of human infestation until 1924, when its occurrence in three aborigines in Northern Australia was affirmed by SWEET (1924), but the identification in these later cases was based solely upon the eggs found in the faeces.

Trichostrongylus colubriformis.

As *Strongylus subtilis* this worm was originally described by LOOSS as a parasite of man in Egypt. It has since been recognized under the name *Trichostrongylus instabilis*, as a common parasite of sheep in Europe, and a case in man in Russia has just been recorded by PODJAPOLSKAJA (1924). As long ago as 1892 the same parasite was described from sheep in India, under the name of *Strongylus colubriformis* by GILES [LANE (1913].

Trichostrongylus orientalis.

In the paper in which he created the genus *Trichostrongylus* LOOSS gave Japan as an endemic focus of *T. subtilis*. In 1914 JIMBO, however, reported 27 cases out of 57 autopses, as infections with a new species *T. orientalis*. OI (1916) and more recent writers have shown that in Japan, Korea and Formosa, the eggs of this parasite are commonly associated with those of the hookworm in the faeces of agricultural workers. LEGER (1921) describing results of the microscopic examination of 5,000 stools, noted three unrecognized nematode eggs, one of which was probably that of *Trichostrongylus*.

Oesophagostomum brumpti.

Immature forms of this parasite of the large intestine were first collected by BRUMPT in 1902, from East Africa [RAILLIET & HENRY (1905)]. LEIPER (1911) found six specimens among hookworms collected by FOY in Northern Nigeria and later identified the species in 5 per cent. of the prisoners in Zungeru in Northern Nigeria, giving the opinion, however, that it was the same as that occurring in the local monkeys. IHLE (1922), however, has pointed out that the form named *O. apiostomum*, which was found by WILLACH in Asiatic monkeys, differs in a number of small points from the African form. On this account he is led to make a new sub-genus *Conowebera* for the two species *O. apiostomum* and *O. brumpti*. GOODEY (1924), who has recently revised the genus *Oesophagostomum*, sees no valid grounds for its division into subgenera. The life of *Oesophagostomum apiostomum* outside the body has been described by WALKER (1913) and that of other species and their later stages within the body by GOODEY (1924).

Triodontophorus deminutus.

This parasite of the large intestine resembles a hookworm in the naked eye appearance of adult and egg, although its microscopical characters are markedly different. According to LEIPER (1915) it is of more than incidental occurrence in man in Nyasaland.

Syngamus kingi.

The record of gapes in the human subject is based on a single pair of Syngamus worms coughed up in blood by a nun, resident in St. Lucia [LEIPER (1913)]. The specimens differed from *Syngamus trachealis*. The species more recently noted in goats in the West Indies by RANSOM (1921) is probably identical.

Necator americanus.

In 1923 the Hookworm Commission of the Baltimore School of Hygiene found in 89·9 per cent. of the pigs in Trinidad a Necator closely resembling *N. americanus.* Further studies by ACKERT and PAYNE (1923) led to its differentiation under the name *N. suillus.* GORDON (1923) has studied in detail material from pigs in the Amazon region and is forced to the conclusion that the points of differentiation originally set out by ACKERT and PAYNE (1922) are not constant. GOODEY has attempted to infect young pigs in England with larvae of *N. americanus,* but without success. The clearing up of this question is obviously one of very great public health significance. As GOODEY points out, there occur in pig faeces eggs remarkably like those of hookworm, but which actually belong to nematodes of other genera which parasitize the pig. LAGG and RHEUBEN (1921) reported hookworm from semi-domesticated pigs in Queensland, which were identified as *Ancylostoma duodenale.* Five of these have since been re-examined by Dr. DARLING, and according to ALBISTON (1922) three proved to be *N. americanus* and two *Ancylostoma duodenale.* MAPLESTONE (1921) showed that in the Townsville district of Queensland none out of 182 pigs was infected with hookworm. O'CONNOR (1923) reported that *N. americanus* prevailed in the Gilbert and Ellice Islands, while *A. duodenale* was scarce. His identification of hookworms (*A. duodenale*) in the local pigs has been shown to be erroneous, his specimens having been described since as belonging to the genus *Globocephalus* [CAMERON (1924)].

Ancylostoma braziliense.

Under the name of *Ancylostoma ceylanicum,* a common parasite of dogs and cats was first identified by LANE (1913) as an occasional parasite of man in India, and later by DARLING in Malaya and Brazil. LEIPER (1913) first pointed out the apparent identity of *Ancylostoma ceylanicum* with *Ancylostoma braziliense.* This view has now been accepted by most recent writers, LANE (1922), DARLING (1923). As a parasite of dogs it has since been recorded from Sierra Leone, Zanzibar, Panama, British Guiana and the Philippines.

(*To be concluded.*)

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BERIBERI.

i. STANTON (A. T.). **The Control of Beriberi in the Far East.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore, 1923.* pp. 172–182. [3 refs.]

ii. SAWYER (W. A.). **Advantages of Nation-Wide and International Organization for Disease Control, with Special Reference to Hookworm Disease and Beriberi.**—*Ibid.* pp. 183–192. [5 refs.]

iii. BERNARD (Noël). **Recherches sur le béribéri.**—*Ibid.* pp. 193–204.

iv. FUKUSHIMA (Hisashi). **Beriberi and its Control in the Japanese Navy.**—*Ibid.* pp. 205–208.

v. NISHIMURA (Y.). **The Influence of Barley Diet on Ship Beriberi.**—*Ibid.* pp. 209–210.

vi. BARROWCLIFF (M.). **The Vitamins.**—*Ibid.* pp. 211–217.

vii. MEGAW (J. W. D.). **The Beriberi Problem.**—*Ibid.* pp. 218–233. [7 refs.]

i. This has already been fully reviewed (see this *Bulletin*, Vol. 21, p. 95).

ii. The author deals with the difficulties which are likely to result from compelling the use of unpolished rice through legislative enactments, and notes the results where these have already been carried. In the Pacific islands beriberi is not very frequent but is much in evidence among the pearling fleet at Thursday Island. The quarantine officer estimates that in 1922 about one-fifth of the men developed the disease. The diet consisted essentially of white flour, polished rice, and tinned foods. The officer at Port Darwin reported only six severe cases in sixteen months, all Europeans from the interior who had been living exclusively on white flour and corned beef; about six months of this diet is sufficient to produce beriberi.

iii. The substance of this paper has already been reported in relation to *Bacillus asthenogenes* [this *Bulletin*, Vol. 19, p. 755; Vol. 21, p. 635].

iv. An historical account of the steps taken by the Japanese Naval authorities to prevent the outbreak of beriberi. The rations in force at the present time are given in a table. During the last few years, it is stated, there has been a considerable increase in the incidence of the disease. Under 1·0 per 1,000 in 1912, in 1919–21 it was over 4·0. This was partly due to relapses of the disease contracted before entry and partly to an increase of white rice in the ration. Since 1921 the rice has again been reduced with good effects.

v. In 1922 the Nippon Yusen Kaisha put into operation a regulation that the boiled rice (the staple article of food for the crew) should be mixed with 30 per cent. of barley. The resulting reduction of the incidence of beriberi was very satisfactory. Figures from all the Japanese line steamers show that the incidence before the issue was 3·3 per cent., and afterwards 1·8.

Etiologically, the author considers that ship beriberi differs from shore beriberi as seen in Japan.

vi. This is a short résumé of our knowledge of the various vitamins and contains nothing new.

vii. Has already been reviewed (see this *Bulletin*, Vol. 21, p. 631).

P. W. Bassett-Smith.

Cobb (C. E.). **Beriberi and Rice Control in Malaya.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 401–402. With 1 chart in text.

The author noted that at the end of 1921 beriberi was increasing at Kuala Pilah, F.M.S. A detailed study of the disease showed that its disappearance in 1919–20 coincided with a time of rice shortage, and when again rice was plentiful beriberi again became endemic. At the time the improvement was noted the rice ration was reduced by about half and flour substituted, with a larger supply of sweet potatoes and Indian corn; the rice at the period was of an inferior quality, lightly milled and therefore richer in vitamins than white rice. The author concludes that beriberi can be eliminated from Malaya without the prohibition of white rice if [a large if] the natives can be persuaded to take a larger amount of flour and fresh vegetables in their diet, and if the importation of very highly polished rice is restricted. This requires more propaganda.

P. W. B-S.

Bijlmer (H. J. T.). **De Vitamine-rantsoeneering.** [The Vitamin Rationing.] (From the Medical Reports of the Scientific Central New Guinea Expedition, 1920–1921.)—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 657–669.

There were no cases of beriberi during this expedition, which is in striking contrast with previous experience in the same district. Besides unpolished rice (as far as practicable, in view of its durability) as principal food, the accessory foodstuffs issued were as good and as varied as possible.

Katjang idjoe (*Phaseolus radiatus*) cannot be taken long enough in the quantities required to supply vitamin B. Soja beans and peanuts were much appreciated, and Bijlmer expresses his satisfaction with the milkpowder " Trufood."

W. J. Bais.

Van der Walle (N.). **Over beri-beri en het antineuritische vitamine.** [On Beriberi and Antineuritic Vitamins.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 20. Vol. 68. 2nd Half. No. 12. pp. 1487–1498. With 8 figs.

A historical summary of the work on the etiology of beriberi done in Netherlands India, beginning with Eykman's experiments on polyneuritis gallinarum and Vorderman's statistical researches on beriberi in various prisons of Java and Madoera, which showed the composition of the food (rice) to be the only factor markedly correlated with the incidence of beriberi, investigations which have led to the study of deficiency diseases in general. Stress is laid on the importance of the determination of the quantity of phosphorus pentoxide contained in the grains (taught first by Fraser and Stanton) as a practical means of testing the quality of rice, a test extensively used by Schüffner and Kuenen in the plantations of Eastern Sumatra. An obstacle to the application of this knowledge on a large scale exists in the fact that rice not despoiled of the layer of aleuronic cells cannot be stored for a long time without being spoilt by insects or mould, whereas rice treated in this way can. The practical fight against beriberi has to take account of this fact, together with the aversion to untreated rice shown both by natives and Europeans (soldiers).

N. H. Swellengrebel.

BLACKLOCK (D. B.). **Investigation into the Causes producing Beri-beri in Freetown Prison, December, 1922.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1922.* Appendix 5. pp. 61–66. [2 refs.]

In the Freetown jail between June and the end of 1922 there was an outbreak of beriberi, 59 cases with 3 deaths.

Professor Blacklock investigated the nature of the diet and the method of preparation and cooking of the foodstuffs. He considered that the diet scale was good and that in all probability the outbreak was due to two factors: (1) Overcooking of the food; (2) Deterioration of the rice from age and storage. The following important facts were particularly noted:—

The rice was cooked in a steam boiler for about 2 hours at a pressure of 10 to 15 lbs., the excess of water having been drawn off and *thrown away* with the soluble vitamins; the actual time employed varied, but it was always too long. The rice sample from which the food was prepared consisted of bad, mixed with a little good grain, the former having been much destroyed by weevils, which also no doubt greatly reduced the vitamin content. As these conditions were present all through the year, the irregular outbreaks of beriberi must be influenced by other secondary causes, such as long storage, damp weather, gastro-intestinal disorders, and in native quarters by overcrowding and bad sanitation. Thus a diet which in the raw state contains just sufficient vitamin is by these methods of cooking so reduced in vitamin value that it affords but a small margin of safety; this margin is largely lost when the rice grains are partly destroyed by weevils; then an epidemic starts and continues, but is stopped at such times as new rice comes into use, age and storage *per se* having little influence.

It is recommended that damaged foodstuffs should be discarded, that the present methods of cooking should be corrected and the water in which the rice is cooked should not be thrown away. Raw tomatoes, etc., should be added to the diet, and a portion of the meat ration should always be in the form of liver, brain, or sweetbread, substances rich in anti-beriberi vitamin.

P. W. B-S.

BLACKLOCK (D. B.). **Lack of Exercise as a Determining Factor in the Epidemiology of Beri-Beri.**—*Brit. Med. Jl.* 1924. June 14. pp. 1046–47. With 1 chart in text. [3 refs.]

A statistical record of beriberi in Freetown Prison, Sierra Leone, for a period of ten years. It is shown that both incidence and mortality were highest in persons of sedentary occupation. In 1922 out of the 59 subjects of beriberi there were 34 tailors, that is, 57 per cent.; the average daily strength of tailors was 15 per cent. of all prisoners, thus 15 per cent. of the inmates engaged as tailors yielded 57 per cent. of all the notified cases of beriberi. *It would therefore seem that there was something which rendered them specially prone to the disease.* This did *not* depend upon long detention in the jail, and on investigation the lack of exercise of these men was the most noticeable factor. When in 1923, with modification of the diet, exercise was made compulsory, there was a great reduction of cases, so that the usual autumn rise was absent. Experiments on fowls showed that in a group of animals subsisting on a diet with insufficient anti-beriberi vitamin, want of exercise was a very important factor in precipitating death. The deduction is that certain sedentary occupations, such as tailoring, mat-weaving and basket-making in jails, do not provide sufficient exercise. This opens up interesting problems in metabolism.

P. W. B-S.

BOYCOTT (A. E.). **Lack of Exercise as a Determining Factor in Beri-Beri.** [Correspondence.]—*Brit. Med. Jl.* 1924. June 21. p. 1112.

The writer discerns a possible parallel between (1) the observation of BRADDON & COOPER that a reduced carbohydrate diet is preventive of polyneuritis in birds, since birds experimentally starved do not develop the disease, and (2) BLACKLOCK's observations that exercise is to some extent preventive of beriberi, since active exercise is in one sense equivalent to a reduction in diet (the food being dissipated straightway in work).

P. W. B-S.

SUZUKI (Tadashi) & MORI (Shinnosuke). **Meningeal Cases of Infant Beri-beri in Manchuria.**—*Jl. Oriental Med.* Dairen. 1924. Feb. Vol. 2. No. 1. pp. 30–54. With 8 figs. [12 refs.]

The authors' special object was to demonstrate the pathology of the meningeal forms of infantile beriberi as observed by them in their own clinic. There were 110 cases, of which 13·8 per cent. were of the meningeal type, 75 per cent. cardiac, 16·8 paralytic, and 2·9 dropsical. The meningeal type was rare in young infants but prevalent after the 5th month; in 9 cases of the 14, the mother was suffering from beriberi. Its prevalence was greatest in the summer, and the mortality relatively to the cardiac type was small. The incubation averaged eleven days, and the duration of the disease about thirty-five days. Among the symptoms palpitation, enlargement of the liver, and distention of the abdomen were present in a large number, with ptosis and dimness of vision. By the examination of the spinal fluid and the fundus oculi during life stasis in the vessels was proved. The authors, from their observations, conclude that the stasis in the meninges and brain is the cause of the type of symptoms, just as in the cardiac type the paralysis of the heart causes stasis in the liver. The paper is illustrated by photographs of patients and by microphotographs.

P. W. B-S.

FRICKER (J. M.). **Une épidémie de béri-béri à forme humide en France.**—*Arch. Méd. et Pharm. Milit.* 1924. May. Vol. 80. No. 5. pp. 453–461. With 1 chart.

In the summer of 1923 a number of Madagascan soldiers were admitted to hospital with oedema, mostly of the lower extremities, and the symptoms were attributed to the hydropic form of beriberi, ankylostomiasis being carefully excluded. Fifteen were closely observed, and all rapidly recovered when put upon an anti-beriberi diet, including raw eggs, green vegetables, salads, lemons and yeast. The chief interest lies in the appearance of the wet type of beriberi among natives who had been on French soil for over a year, and the question arises: Were these " latent " cases imported from Madagascar, or was the disease contracted in France? The author believes in their endogenous origin, as the men had not shown any symptoms for over a year after landing (not a very sound argument), and it is stated that besides the dietary insufficiency it is necessary to take into consideration the susceptibility of the race. Among the French troops on the same diet in the same place there were no cases during the period.

P. W. B-S.

FINDLAY (George Marshall). **A Preliminary Note on the Destruction of Vitamin B by Age.**—*Biochem. Jl.* 1923. Vol. 17. No. 6. pp. 887–890. With 5 figs. [3 refs.]

The question of the destruction of vitamin B by age is one which requires further and fuller investigation, more particularly with regard to the effects of heat and moisture. The author found that samples of Indian lentils and peas which had been kept in bags in a dry room in Scotland for 38 years still contained an appreciable quantity of vitamin B. In comparison with the observations of GHOSE, however, they appear to have lost a small amount. Seeds which have lost the power to germinate have not necessarily lost all their vitamin content.

P. W. B-S.

BERNARD (P. Noël) & GUILLERM (J.). **Fermentation du contenu stomacal dans le béribéri humain et dans la maladie expérimentale due à** *B. asthenogenes* **chez le porcelet.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No 5. pp. 382–397. [3 refs.]

In continuation of previous work the author describes in detail experiments to prove that in the contents of the stomach of both beriberi patients and piglets infected experimentally with *B. asthenogenes* there occurs a fermentation which is accompanied by an alteration of the natural secretions. This fermentation is characterized by hyperacidity due to lactic acid and volatile organic acids, and a hypochlorhydia or " hypopepsia " which goes on to " apepsia." It is associated with an asthenic condition of the stomach wall and retention of the contents of the organ. The walls of the stomach, constantly bathed in the hyperacid fluid, show congestion, erosions, and haemorrhagic ulcerations, both in man and in experimental animals. The experiments tend to show that the *B. asthenogenes* multiplies and coats the alimentary mass in the acute stages. In human beriberi at the time of death the organism is much less abundant. It remains to be proved whether *B. asthenogenes* causes gastro-intestinal symptoms, or whether it is only a secondary complication in beriberi; but in piglets fed upon the human beriberi stomach contents the same symptoms were produced as when they were infected experimentally with a culture of *B. asthenogenes.*

P. W. B-S.

i. BERNARD (P. Noël). **Diagnostic bactériologique de** " *Bacillus asthenogenes.*"—*C.R. Soc. Biol.* 1924. Dec. 5. Vol. 91. No. 34. pp. 1197–1198. [6 refs.]

ii. ——. **La toxine de** *Bacillus asthenogenes.*—*Ibid.* pp. 1199–1200.

i. The author again describes the characters of *B. asthenogenes* and points out that it has two distinct phases of existence—one aerobic and saprophytic in which spore formation is observed, and the second anaerobic when it secretes a toxin and develops pathogenic powers.

ii. The toxin is obtained from anaerobic cultures. The filtered culture contains only one-third the amount of toxin found in the unfiltered. It is lethal to rabbits when given intravenously, intracerebrally, and intraperitoneally, 1 cc. of the filtrate killing in 2 or 3 hours. The toxin produces necrosis of the skin at the site of injection, marked lesions of the stomach, intestines and kidneys, and has a special predilection for the nerve elements. An antitoxin can be prepared from horses which will neutralize its action.

P. W. B-S.

KATO (Genichi). **Further Studies on the Nervous Paralysis of the Polished Rice Disease.**—*Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. pp. 233–237. [1 ref.]

This is a report of work carried out by several observers in KATO's laboratory at his suggestion, some results of which have already been published. Fowls were used. The H. ion concentration of the blood and tissue fluid around the nerves was estimated and the rate of the impulses in the nerves measured. It was found that in the affected fowls the H. ion concentration of the tissue fluid surrounding the sciatic nerve was markedly increased, while in simple starvation it remains normal. In the former the absorbability of positive charged ions is increased and the nerve is unable to conduct impulses normally. The normal rate of impulse is 60 to 70 metres per second, in the paralysed nerves 30 to 40 only.

It was found that the *direct* action of vitamin B will rapidly restore the conductivity of the paralysed nerve ; it was also shown that the heated rice bran extract, free from vitamin B, can also cure the paralysed nerve when acting directly upon it, if the extract is nearly neutral or alkaline (pH 7·3). Ringer's solution containing a " buffer " substance (as bicarbonate of soda) (pH 8) can restore the rate of conduction of the diseased nerve if it is made to act directly on it, whereas the same solution without the buffer substance (pH 6·3) has no effect at all. The author concludes, therefore, that these experiments prove his theory that the paralysis is due to the variation of the H. ion concentration of the tissue fluid around the nerves.

P. W. B-S.

HOAGLAND (Ralph) & LEE (Alfred R.). **Antineuritic Vitamin in Poultry Flesh and Eggs.**—*Jl. Agric. Res.* Washington. 1924. May 3. Vol. 28. No. 5. pp. 461–472. [6 refs.]

A careful study was made by the authors of the value of the vitamin B content in the flesh of different varieties of fowls and eggs ; pigeons were used as the test birds. Unlike COOPER, who states that egg yolk exceeds all other foodstuffs in antineuritic value which is not materially altered by boiling for 4 minutes, they conclude that hens' eggs have a rather low vitamin value. Flesh from fowls was also relatively deficient, that of growing chickens had rather more B vitamin, the highest content being present in the livers. The details of the work are fully set out in protocols, but it is stated that the investigations were not sufficiently complete for final conclusions to be drawn.

P. W. B-S.

GARCIA (Faustino) & GUEVARA (Romulo). *[In English and Spanish.]* **A Study on the Toxicity of Tikitiki Extract by Parenteral Administration. La toxicidad del extracto de tikitiki por via parenteral.**—*Jl. Philippine Islands Med. Assoc.* 1924. Apr. Vol. 4. No. 4. In English pp. 125–132. [4 refs.] In Spanish pp. 157–159.

A very considerable number of experiments with the tikitiki extract were made on frogs, guineapigs, cats and dogs. The extract was from two sources, one from the Bureau of Science, in 50 mil bottles; the other in ampoules from Manuel Zamora; both were acid to litmus. Hypodermic injections of the semi-crystallized substance have given rise to toxic symptoms; hence this work. The results shortly stated were: (1) Subcutaneous, intramuscular, intraperitoneal and slow intravenous injections of the extract were fatal to the animals only in large doses; (2) It acts as an irritant to tissues causing congestion, oedema, and haemorrhages; (3) Rapid intravenous injections may kill immediately; (4) Its toxicity is lessened by neutralization with sodium carbonate; (5) Fatal doses when given either rapidly or slowly cause salivation, rapid and deep respiration, convulsions, with final cessation of the heart's action and respiration. For a man of 60 kilos weight 42 mils of the tikitiki extract is a sure sublethal dose.

P. W. B-S.

UYEHARA (Kikuji), SO (Takehiko) & FUJINAMI (Hisashi). **[On the Influence of the Component of the Rice Bran Extracts against the Salt Metabolism in Beriberic Patients.]**—*Igaku Chuo Zassho.* (*Central Jl. Med.*). 1924. July. Vol. 24. No. 24. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 262–263.]

In dry beriberi there was no increase in the NaCl in the blood, though an increase was found in oedematous cases. The secretion of NaCl by the kidneys in cases of oedematous beriberi is reduced on a diet deficient in vitamin B, but marked diuresis followed the administration of this vitamin. This was the result of restoring normal conditions and was not due to stimulation of the kidneys, for when this diuretic action was brought about by the vitamin B the salt content of the blood plasma was decreased.

P. W. B-S.

i. TAGAWA (Sentaro) & KANEKO (Shingo). **[Loss of Patellar Reflex in Beriberi and Sympathetic Muscular Tonus.]**—*Tokyo Igakkwai Zasshi* (*Jl. Tokyo Med. Soc.*). 1923. Dec. Vol. 37. No. 12. [Summarized in *Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. p. 75.]

ii. SON (Yuko). **[On Beriberi Weak Vision Complicated with Retinal Hemorrhages.]**—*Chuo Gankwa Iho* (*Central Jl. Ophthalm.*). 1924. Vol. 16. No. 1. [Summarized in *J. M. W.* Vol. 4. No. 4. p. 102.]

iii. IJIRI (Matagoro). **[On the Poisonous Constituents of Urine of the Beriberic Patient.]**—*Chugwai Iji-Shimpo* (*Central Med. Jl.*). 1924. June. Vol. 43. No. 11. [Summarized in *J. M. W.* Vol. 4. No. 9. p. 237.]

iv. TSUJI (Yoshikiyo). **[On the Lipoid Contents of the Blood in Beriberi.]**—*Iji-Shimbun.* (*Med. News*). 1924. June. No. 1141. [Summarized in *J. M. W.* Vol. 4. No. 9. p. 238.]

v. KOBAYASHI (Yoshiwo). **[Studies on Edema of Beriberi. III Communication. On Salt Metabolism in the Patient having Beriberic Edema.]**—*Tokyo Igakkwai Zasshi* (*Jl. of Tokyo Med. Soc.*). 1924. Feb. Vol. 37. No. 2. [Summarized in *J. M. W.* Vol. 4. No. 6. p. 131.]

vi. ——. **[Studies on the Edema of Beriberi. IV Communication. On the Influence of Sitting Posture to the Water Metabolism in Beriberic Edema.]**—*Ibid.* Mar. Vol. 38. No. 3. [Summarized in *J. M. W.* Vol. 4. No. 8. p. 210.]

vii. ——. **[The Erythrocytal Precipitation Velocity of Beriberic Cases and other Edematous Cases with Special Relation to Serum Albuminglobulin Ratio.]**—*Igaku Chuo Zasshi.* (*Central Jl. Med.*). 1924. May. Vol. 21. No. 21. [Summarized in *J. M. W.* Vol. 4. No. 8. p. 204.]

i. The injection of adrenalin did not restore the patella reflex in cases of tabes and beriberi, though in other conditions, such as infectious jaundice, the lost reflex could be re-established.

ii. Two cases of defective vision in young adult beriberi subjects are reported. Haemorrhages were seen around the papilla. Intoxication from some unknown poison occurring in beriberi was believed to be the cause.

iii. The author states that he was able to separate the poisonous constituents (nature not given) from the urine and faeces of beriberic cases. These were said to have certain paralysing effects upon pigeons, guineapigs, mice and frogs.

iv. There were no marked quantitative changes in the amount of lipoid in the blood except in severe cases, when an increase of the total fatty acid contents was met with, but there was a decrease of cholesterin and lecithin. There was no regularity in these readings.

v. The author found that if he gave to a case of oedematous beriberi in the morning 10 grams of common salt in 1,000 cc. of water, the average urine passed in the next four hours was 500 cc. The water accumulated in the body and the blood concentration was decreased. The salt also accumulated in the body tissues.

vi. It is stated that in the sitting posture there was less secretion of water by the urine than in the recumbent position; after four hours there was no accumulation of water in the body, but the consistency (density?) of the blood was increased.

vii. The author states that by the red cell precipitation test beriberi oedema might be diagnosed from that of complicated kidney diseases, but not from that of cardiac oedema or granular kidney.

P. W. B-S.

i. TOIDE (Gumpei). **[On Human Case of Vitamin B Deficiency.]**—*Nisshin Igaku* (*Progress in Medicine*). 1924. Apr. Vol. 13. No. 6. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 204.]

ii. KAMIZA (Rikei). **[On Beriberi-like Disease of Mammalians and Birds which develops in the Condition of Potassium Deficiency and Therapeutic Value of Potassium Preparations against Beriberi. II Communication.]**—*Jikken Igaku Zasshi.* (*Jl. Experim. Med.*). 1923. Aug. Vol. 7. No. 8. [Summarized in *J. M. W.* Vol. 4. No. 3. p. 78.]

iii. OGATA (Tomosaburo), KAWAKITA (Shintaro), SUZUKI (Tsui) & KAGOSHIMA (Shigeru). **[On Polished Rice Disease of Birds. II Communication. On Polished Rice Disease by Comparatively Vitamin B Deficit Feeding.]**—*Nissin Igaku* (*Progress in Med.*). 1924. Feb. & Mar. Vol. 13. Nos. 4 & 5. [Summarized in *J. M. W.* Vol. 4. No. 7. pp. 180–181.]

iv. ——, ——, —— & ——. **[On the Vitamin B Accumulation of the Viscera with Special Reference to that of Vitamin B Deficiency, or Polished Rice Disease.]**—*Ibid.* Apr. No. 6. [Summarized in *J. M. W.* Vol. 4. No. 8. p. 204.]

v. IKEDA (Tokichiro). **[Studies on the Efficacious Portions of Rice Bran Extracts upon Polished Rice Disease of Birds. II Communication.]**—*Tokyo Igaku Zasshi* (*Jl. Oriental Med.*). 1924. Feb. Vol. 2. No. 1. [Summarized in *J. M. W.* Vol. 4. No. 8. pp. 204–205.]

vi. SHIBATA (Yasaburo). **[On Diuretic Action of Suzuki's Roh-Orizanine.]**—*Iji Shimbun* (*Med. News*). 1924. May. No. 1140. [Summarized in *J. M. W.* Vol. 4. No. 8. p. 203.]

vii. KONDO (Yoshikazu). **[Contributions to the Knowledge of Polished Rice Disease of Fowl.]**—*Taiwan Igakkwai Zasshi* (*Jl. Formosan Med. Soc.*). 1923. Nov. No. 231. [Summarized in *J. M. W.* Vol. 4. No. 3. pp. 74 75.]

i. The author tried vitamin deficiency feeding on 5 subjects, including himself. Three were fed on polished rice and quickly developed symptoms agreeing with those seen in birds. Two were on a diet "supplied by T. factory," proved to be totally free from vitamin B [no detail given]; in these the symptoms were delayed but were similar to those of true beriberi. These experiments represented conditions of acute and chronic vitamin B deficiency.

ii. In animals fed upon polished rice with the addition of a small quantity of potassium carbonate the onset of the disease was delayed; but with the addition of a considerable quantity of sodium carbonate to a polished rice diet the latent paralysis and other symptoms developed earlier than in the controls. In both cases the symptoms were ameliorated by vitamin B—rapidly in the former case (K deficit), very slowly in the latter case (Na excess).

iii. The observations show that in polished rice disease there are two marked pathological stages, namely, a hyperglycemia, and a polyneuritic stage. They conclude that the polished rice disease in birds is quite different from the disease known as human beriberi.

iv. The authors were unable to find any deficiency of vitamin B in the liver of 14 patients; this they consider supports their view that human beriberi and vitamin deficiency disease are different.

v. From the rice bran extract the author obtained cholin, guanin, adenin, xanthin and hypoxanthin; cholin was apparently the most important, as it favoured the proliferation of bacteria.

vi. It has been found that Suzuki's Roh-Orizanine (a crude rice bran extract) is beneficial in oedematous cases of beriberi. Animal experiments,

carried out to determine the point, showed that it had no diuretic action on healthy rabbits or upon normal rabbits injected with saline.

vii. If a fowl is fed " for three or four times " upon a polished rice diet, it is said to acquire a certain degree of fastness against vitamin B deficiency, at least the development of symptoms is delayed. In the initial deprivations the islands of Langerhans in the pancreas were found to be increased in number, but not in the later privations. Warmth seemed to increase the susceptibility, but sex did not appear to have any influence.

P. W. B-S.

i. IKEDA (Tokichiro). **Ueber die wirksamen Substanzen in der Reiskleie gegen die Erkrankung der durch polierten Reis genährten Taube.**—*Jl. Oriental Med.* Dairen. 1923. Aug. & 1924. Feb. Vol. 1. No. 3. Vol. 2. No. 1. pp. 116–121 ; 90–101. [9 refs.]

ii. BERNARD (Noël). **Recherches sur le béribéri.**—*Rev. d'Hygiène.* 1924. May. Vol. 46. No. 5. pp. 429–441.

iii. MASSIAS (Charles). **Recherches nouvelles sur le béribéri.**—*Gaz. Hebd. des Sciences Méd. Bordeaux.* 1924. Apr. 13. Vol. 45. No. 15. pp. 228–230. [5 refs.]

i. This paper is almost purely chemical and should be read in the original by all who are specially interested.

ii. Contains nothing new, but repeats the author's views with regard to the relationship of *B. asthenogenes* and beriberi.

iii. Contains nothing new, but the work of Noël BERNARD with the *B. asthenogenes* as an etiological factor is given marked prominence, as opening up new views and possibilities.

P. W. B-S.

SCURVY.

MIYAKE (M.). **A Statistical Observation of Infant Scurvy.**—*Jl. Oriental Med.* Dairen. 1923. Nov. Vol. 1. No. 4. pp. 163–168.

The great increase of infant scurvy in Japan is probably due to the increase of artificial feeding. There were 25 cases in 13 years in the clinic of Prof. HIRAI, Kyoto. 17 of these showed some kind of " hereditary " disease (phthisis 9, asthma 4), 19 were from middle-class families and 5 from poor ones. In 23 the development was feeble, in 6 the infants had never been given mother's milk, in 22 the principal food had been cow's milk, in 3 condensed milk. The incubative period varied between 6 days and 5 months. The symptoms are given with their percentage frequency. Blood tests, made in 18 cases, showed diminution in haemoglobin and red cells, with in some a leucocytosis. No new facts were observed, except that " the polynuclear leucocytes became nearer the lymphocytes." X-rays showed the so-called " crushed layer " in all cases, sub-periosteal haemorrhages in 1/3, *haemorrhages in the bone, most marked in the central parts of the tibia and ribs; the distal end of the forearm was least affected.* With 120 grams of mother's milk and over 15 grams of orange juice daily, the symptoms were in every case cured within one week.

P. W. Bassett-Smith.

i. ZILVA (Sylvester Solomon). **The Antiscorbutic Fraction of Lemon Juice. II.**—*Biochem. Jl.* 1924. Vol. 18. Nos. 3 & 4. pp. 632–637. [2 refs.]

ii. CONNELL (Sidney James Buchanan) & ZILVA (Sylvester Solomon). **The Reducing Properties of Antiscorbutic Preparations.**—*Ibid.* pp. 638–640. [7 refs.]

iii. —— & ——. **The Differential Dialysis of the Antiscorbutic Factor. II.**—*Ibid.* pp. 641–646. [4 refs.] With 1 chart in text.

i. Previous work has shown that the sugar can be removed from decitrated lemon juice by means of fermentation without destroying its activity. In the search for a simpler and quicker method, the purest fraction was obtained from fermented juice, decitrated by a modified method, the fermented solution being submitted to alcohol and basic lead acetate precipitations. Monkeys were used for the tests. The most powerful preparations, whilst keeping approximately the entire activity of the original juice, contained only 0·03 to 0·07 per cent. of solid matter in solution. All the active fractions reduce ammoniacal silver nitrate and decolourize potassium permanganate. The purest preparation showed an extremely low phosphorus and nitrogen content.

ii. Details are given which show that the reducing substance, or substances, is inactivated at a different rate from the antiscorbutic factor, so that part at least of the reducing material is chemically independent of the physiological principle.

iii. Zilva & MIURA in 1921 were able to show that the antiscorbutic factor of lemon juice diffuses through collodion membranes which prevent the passage of methylene blue, etc. This further work based upon the same technique shows that: (1) The diffusion of the antiscorbutic factor proceeds differently from that of sugar and the nitrogenous substances present in decitrated lemon juice; (2) The antiscorbutic factor in swede juice and in lemon juice diffuses through membranes of the same permeability; (3) Indications were obtained which suggest that the size of the active molecule cannot be far removed from that of the hexoses.

P. W. B-S.

DELF (Ellen Marion). **The Antiscorbutic Value of Fresh and Canned English Tomatoes.**—*Biochem. Jl.* 1924. Vol. 18. Nos. 3 & 4. pp. 674–678. [4 refs.]

The juice of fresh tomatoes according to HESS (1920) is a powerful antiscorbutic, and also contains fat-soluble and water-soluble B vitamins. HESS & UNGER found that canned tomatoes also have important antiscorbutic properties after a year's storage. The present experiments were made to determine whether English tomatoes were similarly effective. The results did not prove equal to those claimed in America; they are given in the following table:—

COMPARATIVE VALUE OF FRESH AND PRESERVED TOMATOES.

	Minimum protective dose for guineapigs.	Average.
Pulp of fresh raw English tomato ..	1·5–2·5 cc.	2 cc.
Bottled tomatoes (Chivers) after 4–6 months' storage	5–10 cc.	7·5 cc.
Tomatoes canned whole, 1–2 months old	7·5–10 cc.	8·5 cc.
Tomatoes canned whole, stored 3¾–4 years	10 cc.	

Summary. 1. The minimum daily ration of raw fresh juice of English tomatoes protecting guineapigs from scutvy was between 1·5–2·5 cc.; it is thus not quite as effective an antiscorbutic as fresh orange or lemon juice.

2. A sample of bottled tomatoes (Chivers) which had been stored for six months was found to have lost about two-thirds of its original value.

3. By canning a loss of nearly three-quarters of the original value was sustained. After storage for nearly four years a further but smaller loss had taken place.

4. Canned tomato purée had lost about seven-eighths of the original value. It is very important that the date of manufacture should be stamped on all canned goods.

[The reviewer, in his experiments at Greenwich, found canned tomato a very effective curative agent for guineapigs.]

P. W. B-S.

GERSTENBERGER (Henry J.), CHAMPION (William M.) & SMITH (Donalda N.). **The Effect of Pregnancy on the Course of Scurvy in Guinea-Pigs.**—*Amer. Jl. Dis. Children.* 1924. Aug. Vol. 28. No. 2. pp. 173–182. With 2 charts. [4 refs.]

This is an exhaustive investigation extending over several years, carried out to determine the effect of pregnancy in guineapigs on the antiscorbutic factor and general metabolism. The antiscorbutic used was 5 cc. of fresh orange juice; the average weight of the guineapigs was 500 grams. Many tables and charts are given illustrating the results of the experiments. From these it was evident that pregnancy postponed the development of the characteristic symptoms and lessened their severity; 5 cc. of orange juice supplied as much antiscorbutic factor as the animals would obtain from ordinary green food. There was no evidence that the guineapigs stored up antiscorbutic substances in greater quantity than non-pregnant ones.

It was constantly found that though the signs of scurvy were few during pregnancy (or none, according to NOBEL), the animals died very quickly after parturition, practically in the same way as the non-pregnant animals. This was shown not to be due to a deficiency of vitamin B. It is suggested that the symptoms of active and advanced scurvy are due to secondary bacterial infections, and that a scurvy diet does not produce typical scurvy in the pregnant guineapig because pregnancy possibly raises the resistance of the mother to bacterial invasion. There was no evidence that the foetus itself is able to produce the antiscorbutic vitamin, as does a sprouting germ.

[This emphasizes the fact generally accepted that vitamin C can only be elaborated by the vegetable kingdom.]

P. W. B-S.

MOURIQUAND (G.), ROCHAIX (A.) & MICHEL (Paul). **Action réciproque du terrain scorbutique et de l'infection expérimentale par une tuberculose virulente.**—*C.R. Soc. Biol.* 1924. June 27. Vol. 91. No. 22. pp. 205–208. [4 refs.]

In 1922, with M. BERTOYE, the following conclusions had been reached. In guineapigs a tubercular infection does not accelerate the onset or course of either acute or chronic scurvy. The scorbutic soil does not modify the anatomical evolution of tubercular lesions, but the duration of life is less than in healthy animals [see this *Bulletin*, Vol. 20, p. 399]. The authors' present experiments were made with a bovine strain of tubercle of reduced virulence. Each animal was inoculated with 0·5 mgm., or about 20 million bacteria. This massive infection did not modify in the least the course of the scorbutic lesions. On the other hand, the production of a soil deficient in vitamin C provokes changes in the evolution of tubercle. In animals suffering from chronic scurvy there was greater resistance to the onset, but a more rapid evolution. Reinfection of the animals suffering from chronic deficiency caused a very rapid development of the symptoms and death. In animals suffering from acute deficiency and inoculated, the scurvy symptoms were too rapid to permit sufficiently prolonged observations.

These facts are difficult to explain. They show that by experiment we are able to produce in the tissues certain conditions in which the same bacillus injected in the same dose and in the same way may produce different degrees of infection.

[Note experiment of reviewer in which marmite-fed guineapigs lived longer than controls when infected with tubercle.]

P. W. B-S.

MOURIQUAND (G.), ROCHAIX (A.) & MICHEL (Paul). **Intoxication tuberculinique et scorbut expérimental.**—*C.R. Soc. Biol.* 1924. June 27. Vol. 91. No. 22. pp. 208–209. [1 ref.]

The experiments were carried out to determine the effects of tuberculin on scorbutic animals. The guineapigs received 0·5 cc. of tuberculin three times a week for three months. The evolution of chronic scurvy was not accelerated by chronic tuberculin intoxication.

[Experiments with pigeons subjected to avitaminosis B, by MM. ARLOING & DUFONT, gave similar results. (Cong. Tub. Strasbourg) 1923.]

P. W. B-S.

NASSAU (E.) & SCHERZER (M.). **Skorbut und Infekt beim Meerschweinchen.** [Scurvy and Infection in Guineapigs.]—*Klin. Woch.* 1924. Feb. 19. Vol. 3. No. 8. pp. 314–316. With 2 charts. [12 refs.]

The question whether scurvy is an infectious disease has for long been under consideration; some authors even to-day, chiefly from clinical observations, class scurvy in adults among the contagious diseases. In infants the evidence of infection is less clear, deficiency in diet evidently playing the greater part. In childhood the following two facts are generally noticeable: the onset of the symptoms is almost always accompanied by fever, and there is early evidence of infections, to be regarded as evidence of reduced resistance. It is therefore probable that in infantile scurvy infection plays an important part by injuring the tissues and causing a more rapid destruction of the supplied vitamin and a quicker development of the scurvy symptoms with perhaps keratomalacia.

In the authors' experiments young guineapigs were infected with *Trypanosoma brucei* introduced intraperitoneally. 3–5 animals were used in each of 3 series, receiving: (1) Diet rich in vitamins; (2) Diet without vitamins; (3) No vitamins; not infected with trypanosomes. The infection must not directly affect the health of the animal and mask the scurvy symptoms. The animals on full diet and infected showed no evidence of illness (beyond presence of trypanosomes) in the trial period. In those on the scurvy diet, but not infected, the course was as usual, but in the infected animals on the same diet the signs appeared earlier (10 to 11 days) and the animals died on the 18th to 22nd day.

These experiments show that the combination of scurvy and an infection produces a marked acceleration in the course of the symptoms, but that the infection alone could not be responsible for this. They support the common clinical view that the occurrence and development of scurvy in infants is favoured by repeated and continuous infections.

P. W. B-S.

IWABUCHI (Tomoji). **Ueber Nebennierenveränderungen beim experimentellen Skorbut.** [Changes in the Suprarenals in Scurvy.]—*Beitr. z. path. Anat. u. z. allg. Path.* 1922. Aug. 26. Vol. 70. No. 3. pp. 440–458. With 2 plates & 4 charts. [36 refs.]

Typical changes were found in the adrenals of guineapigs fed upon a scurvy-producing diet. In the cortex there was a general reduction in lipoid formation, though in the inner reticulate zone the lipoid is fairly abundant. The author describes three zones of cells: an outer, the "zona glomerulosa" with moderate, an intermediate or "zona fasciculata," very poor, and an inner, the "zona reticulata," rich in lipoids. Besides the loss of lipoids the cells of the intermediate zone often show degenerative changes, both in the nuclei and in the protoplasm with frequent mitosis. The capillaries are congested and haemorrhages are common. *No evidence of thrombosis or necrosis was found. In the adrenals of starved guineapigs the high lipoid* content described by most observers was found, but the amount was unaffected whether starvation were lingering or quick.

The conditions produced are illustrated by two plates.

[The conditions of the adrenals in scurvy guineapigs has been frequently described by McCarrison and others, who have all noted the haemorrhages, and great increase in size, etc.]

P. W. B-S.

Mouriquand (G.), Michel (Paul) & Berheim (M.). **Nouvelles recherches sur la sensibilisation de l'organisme du cobaye à l'avitaminose.**—*C.R. Acad. Sci.* 1924. Sept. 15. Vol. 179. No. 11. pp. 541–543. [2 refs.]

The authors have described how an attack of experimental scurvy in a guineapig sensitizes it to a later one. The present experiments were made to show if this condition continued indefinitely or gradually passed off. In their first series the period between cure and the fresh period of deficiency feeding was 12 to 42 days; in the present two series of guineapigs, 20 in each, the period was 62 or 87 days. The experiments demonstrated that the sensitization is only temporary, and that it becomes slowly less and less. The histological examination showed that it depends upon the long persistence of the minute lesions and disappears as soon as these do. This parallelism is a new proof that there is no true sensitization, but anatomical sequels, the evidence of which is only shown by minute histological examination.

P. W. B-S.

UNDULANT AND ABORTUS FEVERS.

San Román (Carlos Schneider). With Introduction by Pittaluga (Gustavo). **Contribución al estudio de la fiebre de Malta. Diagnóstico clínico y bacteriológico y tratamiento más apropiado de la misma, basado en la observación de 174 casos en la Ciudad de Yecla (Murcia).**—*Siglo Méd.* 1924. Aug. 2, 9 & 16. Year 71. Vol. 74. Nos. 3686, 3687 & 3688. pp. 113–117; 142–145; 165–167.

The first part of these papers is concerned with a general description of the symptoms and signs of undulant fever, which the author classes in three categories: (1) Cases of sudden onset with high fever, rigors and various visceral manifestations have been described, but among 200 patients the author has not seen a single instance; (2) Those with gradual rise of temperature, sweating, loss of appetite and increasing pallor, which are not numerous; (3) Those of an ambulatory type with irregular slight fever (which may be absent at the time of first coming under examination), general debility, malaise and vague pains. These constitute the majority and many are overlooked.

The second part deals largely with the question of diagnosis, clinical, and bacteriological by blood culture and agglutination. Agglutination in a serum diluted 1 : 20—1 : 50 is regarded as suspicious; above 1 : 50 as specifically positive. Mention, however, is made of the fact that *M. melitensis* may be agglutinated by the serum of tuberculous, enteric, typhus, and kala azar patients, but the titre in which this occurs is not stated. Treatment by vaccines is strongly recommended; the initial dose used was 250 millions and subsequent injections were given every 1-3 days, the interval and dosage being regulated by the clinical state. Serum therapy is not regarded with any favour. Compulsory vaccination of all the goats in the province of Murcia is recommended as a prophylactic measure.

H. Harold Scott.

Salvat y Navarro (Antonio). **Epidemiologia de la fiebre maltesa.**—*Rev. Española de Med. Cirug.* Barcelona. 1924. Nov. Vol. 7. No. 77. pp. 639-650.

This article consists of four sections preceded by an introduction. The first section deals with present ideas as to the close relations existing between *M. melitensis*, *M. paramelitensis* and *B. abortus*; the second with the epidemiological aspect consequent on this close relationship and the possible infection of man by *B. abortus*. The author does not agree that this is *never* pathogenic for man, but believes that some human subjects are susceptible and that the organism may, by passing through such, become "humanized" and more readily attack man. Section III mentions the regulations which have been promulgated to prevent the spread from animals to man, notably the inspection of herds, slaughter of infected animals, segregation of those giving positive serum reactions but from which the organism is not isolated, and so on. The fourth section deals in greater detail with preventive measures—the burning of contaminated pastures to obviate conveyance by soil and water, separation of infected animals to prevent further soil contamination, keeping the sexes apart, prohibition of the use of infected animals for food. For man the use of mixed vaccines of *M. melitensis* and *B. abortus* are recommended.

H. Harold Scott.

MITRA (Mariano). **La intradermoreazione nella febbre mediterranea dell' infanzia.**—*Pediatria.* 1924. June 15. Vol. 32. No. 12. pp. 721–724. [1 ref.]

Intradermal inoculation of *M. melitensis* vaccine in patients suffering or convalescing from undulant fever produces a definite reaction—a rise of temperature, intense erythema some 3 cm. in diameter, and painful oedema at the site of injection gradually disappearing in four or five days. The reaction runs parallel with that of agglutination, diminishing as the agglutination titre becomes less.

H. Harold Scott.

CREPIN (Joseph). **La chèvre est-elle responsable de la fièvre de Malte?**—*Progrès Méd.* 1924. Sept. 13. No. 37. pp. 549–554. [10 refs.]

The author quotes the accepted belief that undulant fever is contracted through the consumption of goat's milk, and states that therefore without goat's milk there can be no such infection [a deduction which has never been made.] He then proceeds to demonstrate that all the evidence which has been brought forward is fallacious; that goats have nothing to do with undulant fever; that there is no such thing as a goat melitensis infection; that it is never found where the herds are under proper hygienic conditions; that if present it is only spread by human infection through the goat herds, etc. He states that the only proof which has been produced is bacteriological, and as the organism cannot be differentiated from *B. abortus* Bang this is most uncertain, and that all serum tests are absolutely unreliable. Portions of various scientific works on the subject are quoted, often apart from the necessary context, so as to support his argument. He particularly refers to and criticizes the Fontainebleau (Samois) outbreak, and that of the "Joshua Nicholson," and suggests that the transhipped animals were suffering not from a melitensis infection, but from strongylosis. Finally, he points out the importance of goat's milk as a financial and food asset to France in combating the infant mortality and general ill-health of the children, stating that the recommendation to boil goat's milk is both bad and physiologically wrong.

[One cannot too strongly deplore the publication of such a misleading and dangerous paper, for no matter how strong the prejudice of the writer may be, it is entirely against scientific and well-attested knowledge.]

P. W. Bassett-Smith.

DE KORTE (W. E.). **A Case of Probable Human Infection with the Bacillus of Epizootic Abortion.**—*S. African Med. Rec.* 1924. Oct. 25. Vol. 22. No. 20. p. 478.

The author describes the very interesting case of a man who apparently contracted a direct infection of *B. abortus* through the removal of the placenta from an animal suffering from "infectious abortion." The most important points noted were: Long duration of the incubative period, 8 weeks; absence of the usual headache and profuse sweats; agglutination of *B. abortus* Bang with the serum, not

M. melitensis; good curative result by the use of abortus vaccine. The rarity of infection with this organism among persons in the endemic areas of epidemic abortion is recognized; it was thought that the man handling the infected placenta and membranes had acquired a massive infection.

[If this was the case it is difficult to account for the long incubative period, and it is very unusual with the serum not to have an associated reaction with the *M. melitensis*.]

P. W. B-S.

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i. LARSON (W. P.) & SEDGEWICK (J. P.). **The Complement Fixation Reaction of the Blood of Children and Infants using the** *Bacillus abortus* **as Antigen.**—*Amer. Jl. Dis. Children.* 1913. Nov. Vol. 6. No. 5. pp. 326–333. [14 refs.]

ii. —— & ——. **Further Studies on the Epidemic Abortion Reactions in Children.**—*Ibid.* 1915. Sept. Vol. 10. No. 3. pp. 197–200. [5 refs.]

i. By the systematic use of an antigen made with *B. abortus* Bang it was noted that tests of the serums of women who had aborted gave a larger percentage of positive than did syphilitic antigen. COTTON & SCHROEDER found that 10 per cent. of market milk was infected with *B. abortus*; infection was therefore possible. 423 children were tested and 17 per cent. showed the presence of antibodies to this bacillus. The question arose, was this an active or passive infection?

ii. Blood taken from 42 newborn children or shortly after birth, when tested, gave in all negative results, but when the blood was taken from infants who had received other than breast milk a positive reaction was sometimes obtained and the infants showed enlargement of the spleen. Children giving a positive Wassermann may show a negative reaction to *B. abortus*. From this it is evident that a specific abortus infection occurs in infants but is generally, if not always, acquired from other than the maternal milk.

P. W. B-S.

BURNET (Et.), BRUN (G.) & BONAN (A.). [**Sur une ostéite suppurée à** "*Micrococcus melitensis*" **chez un sujet convalescent de fièvre méditerranéenne.**]—*Revue tunisienne Sc. Médic.* 1924. Apr. Vol. 18. No. 4. [Summarized in *Bull. Inst. Pasteur.* 1924. July 15. Vol. 22. No. 13. p. 521.]

In a case of undulant fever which had relapsed three times at intervals of seven to twenty years, a suppurative osteitis was found in which the *M. melitensis* was demonstrated. It is noted that after the second relapse the patient had three miscarriages.

The suppuration had the character of a cold abscess. The authors consider that in countries where undulant fever is endemic it is necessary to examine bacteriologically all slow suppurative conditions of bone, and even cases of periostitis and chronic myelitis, for the presence of the specific organism.

P. W. B-S.

LEMAIRE (G.). **Méningite à mélitocoques. Altérations importantes du liquide céphalo-rachidien. Hyperglycorachie. Guérison.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 27. Year 40. 3rd Ser. Vol. 48. No. 34. pp. 1636–1644. With 2 charts.

It is well known that *M. melitensis* produces a great number of local lesions and meningeal symptoms have frequently been described, but changes in the cerebrospinal structures have rarely been demonstrated. The author quotes fully a case in which apparently the early infection was latent and the first marked symptoms were those of meningitis. It was at first thought to be influenza, then tubercular, until the development of agglutinins and the isolation of *M. melitensis* from the cerebrospinal fluid proved its true nature. There was a decided increase in sugar content in this fluid. The author discusses the appearance and diagnostic value of the sugar increase in the fluid in bacterial and in non-infective cases. In the meningitis of undulant fever the cellular reaction is lymphocytic, similar to that found in syphilis and tubercle, but it is noted that on the sixth lumbar puncture in this case, when the nerve symptoms were passing off, there was a very great increase of albuminous substance, possibly due to the frequent injections of vaccine (septicémine).

P. W. B-S.

DE PARTEARROYO (F. R.). **Tratamiento de la fiebre de Malta.**—*Siglo Med.* 1924. Jan. 19 & Jan. 26. Year 71. Vol. 73. Nos. 3658 & 3659. pp. 53–57 ; 85–87.

The author reviews in detail the treatment of undulant fever—serum-therapy, vaccine-therapy, chemotherapy and symptomatic treatment. The serum may be administered subcutaneously, 30-40 cc. (in one case 70 cc. were injected) on the first day, and 20-30 cc. daily or on alternate days subsequently ; or intramuscularly in severe cases, the dose being 20-30 cc. ; in very severe cases by the intravenous route.

Vaccine-therapy is particularly useful for ambulatory, mild and chronic forms of the disease ; autogenous vaccines are found best and the initial dose should be small, in case of intolerance. The author, therefore, begins with 25 millions and, if well tolerated, the dose can be gradually increased up to 2,000 millions, the injections being made every three days. The accidents and untoward symptoms incident to serum or vaccine therapy and their avoidance are mentioned. The causes of failure of vaccines are given as : (1) Use in the acute stages ; (2) Erroneous diagnosis ; (3) Too brief a period of treatment ; (4) Too large doses.

Of drugs, neosalvarsan is particularly favoured in doses of 15 cgm., repeated, if necessary, on the following day. If well tolerated, but if the fever continues, the dose is increased to 30 and even 45 cgm., the higher doses being given every third day until the temperature falls. In one patient who showed no improvement at all after receiving 70 cc. of serum the fever subsided after the first injection of 15 cgm. of neosalvarsan.

[There are no original observations in this paper, and works reviewed are restricted ; a rather too favourable view is taken of neosalvarsan treatment.—P. W. B-S.]

H. Harold Scott.

ARLOING (Fernand) & LANGERON (L.). **Un cas de mélitococcie. Vaccination curative avec phénomène d'Arthus.**—*Bull. Acad. Méd.* 1924. June 10. Year 88. 3rd Ser. Vol. 91. No. 24. pp. 736–738.

The patient was a pupil of the Veterinary College, Lyons, but the origin of the disease was uncertain. The fever was of an undulatory character with typical sweats, pains and large spleen. Haemoculture was not successful, but serum agglutination with *M. melitensis* was positive to 1-400. Treatment with a stock vaccine, which had been used for other cases, in 250 mil dose produced local necrosis and sterile pus at the site of the inoculation ; a second inoculation of the same dose and vaccine was followed by similar results, though less severe. No further inoculations were given but the patient made a good recovery, and in six months was in perfect health. The condition was looked upon as an anaphylactic phenomenon.

[The reviewer has reported a somewhat similar contretemps in which a melitensis vaccine, apparently harmless to others, produced at each inoculation local necrosis and suppuration, together with extensive purpura.]

P. W. B-S.

BURNET (Et.) & DE LAGOANÈRE (J. L.). **Pouvoir pathogène du *M. melitensis* et du *B. abortus* pour le rat et la souris.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 182-191. [9 refs.] Shorter version in *Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 465–467. [1 ref.]

It was found that the two organisms act in a similar manner in both rats and mice. Eighty *Mus decumanus* captured at Tunis from stables containing 3,000 goats of which 5 per cent. at least were infected with *M. melitensis*, when examined after death by culture methods did not yield a single colony of *M. melitensis*. This does not agree with the observations made on brown rats by English observers or of CONOR (1910) in Tunis. *M. melitensis* and *B. abortus* have the same pathogenic action in white rats. By subcutaneous inoculation it takes a million times the dose to infect white rats that it does to infect guineapigs. By ingestion it is difficult or possible only with very large doses. The infection appears rapidly and disappears quickly. The microbes are eliminated and cure is spontaneous. This short duration of the infection explains why natural infection has not been recorded in these animals. With brown and white mice the same dose was used as for rats ; both react to the two organisms. Mice are rather more sensitive than rats and could be used in default of guineapigs ; by mouth infection they were more resistant than by the skin. When infected the course is chronic, the centres of infection are the same as in the guineapig (spleen, lymphatics and bone marrow) and cultivation is easy.

Since the mouse is more sensitive than the rat and the evolution of the infection in the species is longer, mice are more likely than rats to act as reservoirs of the virus ; the mice, moreover, are able to communicate the infection to other animals, and amongst them the cat. The author has been able to infect cats by the subcutaneous method, but not yet by ingestion. Among rats and mice the infection does not always cause the appearance of agglutinating power ; this same irregularity occurs with guineapigs, goats and man. To demonstrate the presence of an infection to *M. melitensis* and *B. abortus* the agglutination reaction is not therefore a reliable method.

P. W. B-S.

POLETTINI (Bruno). **Sui rapporti fra** "*Micrococcus melitensis*" **e** "*Bacillus abortus*" **(Bang).**—*Ann. d' Igiene.* 1924. Oct. Vol. 34. No. 10. pp. 701–715. [15 refs.]

The author carried out tests with 8 strains of *B. abortus* and 6 of *M. melitensis* in order to determine points of distinction, if any, between the two organisms. Firstly, cultural tests were made on several media, but no differences could be detected. He next performed inoculation experiments, subcutaneously, intraperitoneally and intravenously, on a large number of guineapigs, but again found identical tissue-changes at autopsy. Lastly, serological tests were performed—agglutination and absorption of agglutinins and complement fixation. Here certain differences were noted. Anti-abortus and anti-melitensis sera agglutinated their respective organisms in much higher dilution than the heterologous ones if the sera used were those obtained from *patients or from animals experimentally immunized by the author, but with the ordinary commercial immune sera no differences were* detected. Also the complement-fixation power of anti-melitensis serum was four to eight times as great with *M. melitensis* as with *B. abortus.*

In view of these close relations it is suggested that the name *Brucella* be applied generically, the organism of undulant fever being designated *Brucella melitensis*, that of contagious abortion *Brucella melitensis abortus* [see EVANS, this *Bulletin*, Vol. 21, p. 106].

H. Harold Scott.

DOMINGO (Pierre). **Etudes sur la fièvre de Malte. Réaction actuelle optima des milieux destinés à la culture du** *Micrococcus melitensis.*—*C.R. Soc. Biol.* 1924. Mar. 28. Vol. 90. No. 11. pp. 819–820.

A strain of *M. melitensis* which had been shown to agglutinate well with specific serum lost this property when grown on strongly acid media, and if cultured on very alkaline media it was agglutinated by non-specific sera. Nine strains were studied in media varying from pH 8·8 alkaline to 6·8 acid reactions. The optimum for cultures was found to be pH 7·6. It was found that a *M. melitensis* cultivated in a medium more alkaline than the optimum acidified it up to 7·6. If grown in acid or neutral media it varied the reaction of the media as follows: 6·6 to 7·2, 6·4 to 7·2, 6·8 to 7·2, 7·2 to 7·6, 7·2 to 7·6, and 7·4 to 7·6. The author thinks that this modification of the medium by the organism is an evident proof of marked biological adaptation.

[The reviewer has never been able to grow the *M. melitensis* upon very acid media; it has generally been found to be very sensitive to reaction.]

P. W. B-S.

GERBASI (Michele). **Nuove ricerche sul micrococco paramelitense.**—*Pediatria.* 1924. Oct. 1. Vol. 32. No. 19. pp. 1139–1143. [4 refs.]

The serological tests applied to melitensis, paramelitensis and abortus organisms having shown their close affinity, although the biochemical

GERBASI (Michele).

Strain.		Agglutinability.			Clotting of Milk.	Production of Indol.	Fermentation of Sugars.				
		Anti-melitensis serum. Berne.	Anti-melitensis serum. Palermo.	Anti-para-melitensis serum.			Glucose.	Levulose.	Lactose.	Maltose.	Saccharose.
Para-melitensis	I	neg.	neg.	+1/5,000	neg.	—	+	+	+	+	+
	II	neg.	neg.	+1/5,000	incom.	—	+	+	+	+	+
	III	neg.	neg.	+1/2,000	incom.	—	+	+	+	+	+
Melitensis	I	+1/2,000	+1/1,000	neg.	neg.	—	+	+	+	+	+
	II	+1/1,000	+1/1,000	neg.	neg.	—	+	+	+	+	+
	III	+1/1,000	+1/1,000	neg.	neg.	—	+	+	+	+	+
	IV	+1/1,000	+1/1,000	neg.	neg.	—	+	+	+	+	+

Table showing the results of serological and cultural tests with the *melitensis* strains mentioned in the text.

reactions, especially as regards the clotting of m [illegible] e fermentation of lactose, are said to differ, the author dec [illegible] peat the tests, and did so in three series: (1) The study of [illegible] ical properties of *M. paramelitensis* (3 strains) before pa [illegible] ugh animals; the anti-melitensis sera were obtained from Berne and Palermo; the sugars were 1 per cent. in alkaline broth. (2) Analogous tests with *M. melitensis* (10 strains); the Table subjoined gives the results of them. (3) Similar to those of (1), but after passage through young guineapigs; the only differences were that strain III was agglutinated by the homologous serum in 1 in 5,000 in place of the previous 1 in 2,000, and that strains II and III no longer retained the property of clotting milk.

The author draws comparisons between *M. melitensis* and *M. paramelitensis* on the one hand, and *B. typhosus* and *B. paratyphosus* on the other, and adds that his recent researches have demonstrated that *B. paratyphosus* freshly isolated and passed through a guineapig can assume the characters of *B. typhosus*.

H. Harold Scott.

CAZENEUVE (H. J.). **L'hémoculture dans la fièvre méditerranéenne. Isolement du *Micrococcus melitensis* par ensemencement sur gélose glucosée inclinée du sang hémolysé dans de l'eau distillée.**—*Jl. Méd. de Bordeaux.* 1924. Aug. 25. Vol. 101. No. 16 pp. 702–703.

The author describes a method which, he finds, appreciably shortens the time required to isolate an organism from the blood. 5 cc. are drawn, mixed with 15 cc. of distilled sterile water, shaken well for 5 minutes, and then to each of 10 cc. glucose agar slopes 2 cc. of the blood fluid are added. These are kept for one hour in the incubator at 37° C. with the surface covered with the fluid and then placed upright for 24 hours; if then no colonies are visible the tubes are again sloped for an hour and replaced. Some of the tubes are thus treated twice, some three times. On the fourth day colonies of *M. melitensis* will be found in most of the tubes. Further identification can be carried out in the usual way. It is stated that by this means a positive culture was obtained in one case 21 days after the last pyrexial period. The method is recommended for the isolation of many organisms from the blood, especially those requiring the presence of haemoglobin, as meningococcus, streptococcus and *B. pestis*.

P. W. B-S.

NATTAN-LARRIER (L.). **The Diagnosis of Malta Fever.**—*Franco-Brit. Med. Rev.* 1924. Oct. Vol. 1. No. 1. pp. 1–8.

This paper has been summarized [see this *Bulletin*, Vol. 21, p. 648]. The methods used for diagnosis are detailed, blood culture, serum agglutination, and intradermic methods being of the greatest value, but the optimistic value placed on the latter procedure is open to question.

P. W. B-S.

VERNONI (Guido). **La febbre maltese.**—*Terapia.* Milan. 1924. Sept. Vol. 14. No. 63. pp. 278–282.

A general sketch of undulant fever, suitable for a class lecture. It is clearly expressed, but contributes nothing new to the subject.

H. Harold Scott.

ROCKY MOUNTAIN FEVER.

CONNOR (Charles L.). **Immunity in Rocky Mountain Spotted Fever.**—*Jl. Immunology.* 1924. July. Vol. 9. No. 4. pp. 269–289. [9 refs.]

This important report is so condensed that it is difficult to abstract further and should be read in the original. The following are the most significant points. It is almost impossible to attenuate the virus in the blood because the organisms in this fluid are so scanty. In tick tissues and tissues of infected guineapigs the virus may be attenuated by drying in the cold; after keeping for 5 to 30 days at a temperature below zero the tissue is no longer virulent, but will produce immunity. The combination of virus and immune serum is most effective when the virus is given in rather a large dose and allowed to develop for 24 hours, and then a dose of serum is given to stop infection. Another but more limited method is to give rather large doses of the mixture of the virus and serum. An immunity may be obtained equal to that which follows an attack. Heating the mixture of virus and serum at 60° C. for 20 minutes renders it ineffective. The virus-serum mixture is at present only applicable to guineapigs; for larger animals a much more concentrated virus is required. Immunity depends only on the amount of the virus given. The immune body appears to have nothing to do with the production of immunity in another animal.

P. W. Bassett-Smith.

CONNOR (Charles L.). **Quantitative Peculiarities of Mixtures of the Virus and Immune Serum of Rocky Mountain Spotted Fever.**—*Jl. Med. Res.* 1924. Mar. Vol. 44. No. 3. (Whole No. 192.) pp. 317–328. [2 refs.]

The peculiar irregularity of the " zone reaction " or quantitative relation between the protective serum and the virus of Rocky Mountain fever was first noticed by RICKETTS. A study of this reaction has been made by the author, who, working with the virus in guineapigs' blood or serum collected at the height of the disease (·003 being often the lethal dose) and the serum of immunized rabbits or guineapigs, confirmed the observations of RICKETTS.

The following conclusions were arrived at:—

" 1. A paradoxical reaction occurred when titrating the protective property of an immune serum against the virus of Rocky Mountain spotted fever, a small amount of the serum protecting when a larger amount would not. This is part of a reaction showing a 'zone' phenomenon; for by increasing the amount of serum it again protects.

" 2. The phenomenon has been reproduced with immune serum collected early in the disease only, or shortly after reinoculation of an immune animal with virus. It occurs also with normal rabbit serum. It occurred only when the mixtures of virus and serum were diluted with salt solution. A question as to its specificity is raised.

" 3. The reaction is independent of the presence of complement, and the immune serum shows no agglutinating or precipitating action.

" 4. Because of the irregular reaction of mixtures of virus and serum diluted with salt solution an important practical point is brought out. Such diluted mixtures will not give the correct protective titre of the serum."

P. W. B-S.

GREELEY (H. P.). **Mercurochrome-220 Soluble in Rocky Mountain Spotted Fever.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 8. Vol. 83. No. 19. pp. 1506–1507. With 1 chart.

The author reports a case of Rocky Mountain fever from Southern Montana which he treated successfully with an intravenous injection of 20 cc. of a 1 per cent. solution of mercurochrome 220. This was followed by a marked reaction, chill and temperature of 104·8°, but after six hours the pains, etc., were relieved. It is stated that the disease was arrested clinically by the injection. The case is reported in the hope that further trials may be made with this drug where the disease is prevalent.

P. W. B-S.

JAPANESE RIVER FEVER.

WALCH (E.) & KEUKENSCHRIJVER (N. C.). **Eenige opmerkingen aangaande de Epidemiologie van de Pseudotyphus.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 247–276. With 8 figs. & 2 graphs. [12 refs.]. English summary pp. 274–275.

An epidemic of pseudotyphus was noted in young overgrown rubber estates in Sumatra. Fifty per cent. of captured rats harboured *Trombicula deliensis*, with an average of 104 per mite-carrying rat. They were also found upon men and two species of birds. Two new species of Trombidia also were observed on man and *T. oudemansi* once. A man on whom *T. deliensis* was found developed pseudotyphus shortly afterwards. *T. schuffneri*, the common forest mite, can carry the infection, but only when there are many human cases; it plays but a small part in spreading the disease. The disease can be transmitted to gibbons, but not to macaques. An emulsion of *T. deliensis* and the blood of a pseudotyphus patient are equally effective in inoculation of the gibbon. After inoculation rats show no sign of the disease, but the spleens were found to be 1·7 times the ordinary weight, and rats caught in the endemic area show a large percentage with enlarged spleens; it is therefore probable that rats, as in Japan, act as reservoirs.

P. W. Bassett-Smith.

NAGAYO (M.), MIYAGAWA (Y.), MITAMURA (T.), IMAMURA (A.), TAMIYA (T.) & SATO (K.). **On the Experimental Tsutsungamushi Disease in Monkeys by Intracutaneous Inoculation of the Virus.**—*Scientific Reports from Govt. Inst. for Infect. Diseases, Tokyo,* 1923. Vol. 2. pp. 371–373. [Authors' Abstract.]

The authors found that no local diagnostic reaction followed subcutaneous injection of the virus of Tsutsugamushi disease, such as is seen after natural infection through the bites of infective mites. They therefore carried out experiments with monkeys to determine if intracutaneous injection would not be more successful, a procedure which imitates more closely the natural method of infection. They found that a distinctive local papule was present after the 3rd-5th day, and histologically the lesion was similar to that seen after a mite bite; secondary lymphatic signs and fever followed. Animals which had been immunized gave no specific local reaction. The amount of inoculum required to infect intradermally was about 1/10 that required subcutaneously, but the larger the dose the shorter the period before appearance of the reaction and incubation of the fever. From these experiments the authors conclude that the skin is a favourable site for the development of the virus and the method should be of great value for diagnosis.

P. W. B-S.

DENGUE, PAPPATACI AND UNCLASSED FEVERS.

FARRER (E. M.). **Clinical Observations on the Recent Epidemic of Dengue Fever in the Punjab.**—*Jl. Assoc. Med. Women in India.* 1924. May. Vol. 12. No. 2. pp. 20–22.

This was a very widespread epidemic affecting Europeans and natives indiscriminately. The saddle-back type of fever was not frequently noticed. Special reference is made to the glandular implication which generally subsided as the rash faded. The author is very dogmatic in distinguishing this disease from the seven-day fever: " How any one who has seen the two diseases can think that they are the same passes my comprehension." This is, however, a matter of opinion and experience.

P. W. Bassett-Smith.

GIORDANO (Mario). **Osservazioni sopra una piccola epidemia di " Dengue " a bordo della R. Nave " Ammiraglio Magnaghi."**—*Ann. di Med. Nav. e Colon.* 1924. May-June. Year 30. Vol. 1. No. 5–6. pp. 220–231. [16 refs.]

Of a complement of 210 in the Italian ship " Ammiraglio Magnaghi " 70 were attacked by dengue between 2nd and 12th April, the maximum number of fresh cases (22) occurring on the 7th. There was no secondary rise of temperature with the appearance of the rash on the 4-5th day, except in two instances, and in these the rise was small, a few points in one case and to 39° C. in the other. The author thinks that the vector is a Phlebotomus and that quinine (20 cgm. of the bisulphate) is the best prophylactic.

H. Harold Scott.

WHITTINGHAM (Harold E.). **The Etiology of Phlebotomus Fever.**—*Jl. State Med.* 1924. Oct. Vol. 32. No. 10. pp. 461–469. [13 refs.] and *Public Health.* 1924. Nov. Vol. 38. No. 2. pp. 56–60. [13 refs.]

An interesting incident is quoted from Sir W. BURNETT of the occurrence of sandfly fever in the Royal Navy during the blockade of Malta in 1799. The author states that phlebotomus fever is now one of the chief causes of inefficiency in the R.A.F. serving overseas (50 per cent. of total sickness). The pappataci is the true "carrier" and functions when the mean daily temperature is 65° to 90°, wherever there is sufficient moisture and organic debris for the fly to complete its life cycle; this is the case at Malta but not at Baghdad. The chief factors to be considered in the causation of an epidemic are: (1) the virus (a leptospira ?); (2) the carrier—species, sex, nature of the breeding ground (larvae become infected by eating dejecta of infected flies and the imagos from these can transmit the fever only after a feed of blood), presence of infected man, temperature, humidity, etc.; (3) number of non-immunes as recipients. A leptospira has been found by several investigators in the short fevers of the sandfly type and Mediterranean dengue, but its etiological rôle is not quite certain. It has been cultivated but quickly loses its pathogenic property.

[The paper is very interesting and is complementary to others which the author has published on the same subject.]

P. W. B-S.

TEJERA (Enrique). i. **Las fiebres de Macuto y los insectos del género "Phlebotomus."** ii. **Algunas fuentes de anofelinos del Valle de Caracas.**—*Gac. Méd. de Caracas.* 1924. Mar. 31. Year 31. No. 6. pp. 83–84.

i. "Macuto fever" or "Mene Grande fever" is characterized by sudden onset of lassitude, chilliness, headache and backache, with a rapid rise of temperature to 40°–41°C. The pulse is slow, 60 or even 40 per minute, a rosy flush appears on the face and trunk, the conjunctivae are injected, the tongue is red at the edges and furred in the centre, the patient is irritable and sleepless, and there is almost complete anorexia with nausea, and, in some cases, vomiting. On the third or fourth day an eruption [not described] occurs on the face, neck, and dorsum of the hands and feet, and the temperature falls. There may be a slight rise again after four or five days, lasting for a few hours only. The author states that Phlebotomus is present in the district in large numbers and believes that the disease is merely sandfly fever.

ii. Larvae of Anopheles in considerable numbers have been found in named localities near Caracas.

H. Harold Scott.

MINKEWITSCH (Simferopol). [**Das sogenannte "Moskitofieber" der Krim.**] [The So-called Mosquito Fever of the Crimea.]—*Prophylaktische Medizin.* (russisch). 1923. Vol. 2. No. 1–2. [Summarized in *Arch. f. Schiffs- u. Trop. Hyg.* 1924. Aug. Vol. 28. No. 7. p. 307.]

The disease described, known in the Crimea as mosquito fever, is very common and corresponds in its clinical symptoms and epidemiology with pappataci fever. The absence of an exanthem, character of the fever, nature and location of the muscular pains, are against it being dengue. No record of the Diptera of the area is known to the author.

The old idea held 20 years ago by medical men was that the infection was acquired during the voyage.

P. W. B-S.

DE MELLO (Froilano) & DE SÁ (L. Braz). **Febres remitentes ou climáticas da India Portuguesa.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Apr. Ser. 9. No. 4. pp. 120–132.

Cases of prolonged fever are common in Portuguese India, and have been diagnosed as "climatic," "nervous." "remittent" and "double summit" fever (febres de dois crescimentos). The symptoms, an analysis of which from a large number of cases is given, are strongly suggestive of one of the enteric group. Examinations were carried out bacteriologically on 73 patients. From 15 *B. typhosus* was isolated from the blood, and on 6 occasions one of the paratyphoid organisms; 2 were negative. Cultivation of the faeces yielded *B. typhosus* on 40 occasions, *B. paratyphosus* A once, while 9 were negative. The sera from 7 others agglutinated *B. typhosus* in high dilution. The mortality ascribed to this fever is 2,000 annually out of 600,000 inhabitants; thus the enteric group of fevers constitutes a serious sanitary problem in the Province.

H. Harold Scott.

WHEATLAND (F. T.). **Some Notes on Unclassified Fevers occurring in the North Queensland Coastal Regions.**—*Med. Jl. Australia.* 1924. May 17. 11th Year. Vol. 1. No. 20. (Supplement.) pp. 322–324. [3 refs.]

Two types are discussed—(1) Coastal fever, better known as Mossman fever, an account of which can be found in all modern text-books. It is a 21-day fever with headache, pain in the back and legs, enlargement of glands, and occasionally a macular rash. (2) Sarina or West Plane Creek fever. A disease most common in males working in the sugar-cane fields. It is a continued fever somewhat like typhoid but shorter, with headache and in severe cases delirium, a mottled rash all over the body, sometimes diarrhœa and enlarged glands.

The chief distinctions between the two are thus stated:—

	Coastal fever.	*Sarina fever.*
Onset	gradual	sudden
Rigors ...	uncommon ...	common
Bowels ...	constipated ...	occasional diarrhoea
Relapses ...	occur	none
Heart ...	responds to stimulation	does not respond
Mortality ...	1 per cent.	20–30 per cent.

They are not infectious and are probably transmitted by insects, affecting men working amongst timber and scrub.

P. W. B-S.

WILLIAMSON (J. B.). **A Possible Case of Tick Typhus.**—*Jl. Roy. Army Med. Corps.* 1924. Oct. Vol. 43. No. 4. pp. 291–292.

The author describes an interesting case from the Artillery Camp at Saugar, C.P., which was provisionally diagnosed "tick typhus," a disease very similar to Rocky Mountain fever. The pyrexia lasted about 14 days; the macular rash appeared on the sixth day and was well marked; there was also conjunctival congestion and sore throat. The case was at first thought to be syphilitic and "606" was given. The serum reactions were negative for all the typohid group and for syphilis. There was no evidence of Spironema or Rickettsia infection and no history of tick bites or louse infestation. Similar cases had occurred in the camp a year before, but the fever was evidently not infectious as the patient's tent companions were not attacked.

P. W. B-S.

DA COSTA (A. F. W.). **Four Cases of Spotted Fever at Nagpur.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 450–452. With 4 charts.

The author describes four cases of a form of fourteen-day fever *which occurred at Nagpur in November 1923. Three were in one family apparently unconnected with the fourth. Each had a typhus-like* rash on the fourth to fifth day. All recovered. Blood reactions were negative to the typhoid group of organisms, and three gave positive Weil-Felix reactions at dilutions of 1/20. Provisionally the cases were classed as belonging to the typhus-like fevers, but in no instance could lice be incriminated.

P. W. B-S.

MACCORMICK (David D.). **Observaciones sobre la fiebre de Bucaramanga.**—*Report. de Med. y Cirug.* Bogotá. 1924. Apr. Vol. 15. No. 7. (No. 175). pp. 347–356.

Bucaramanga fever has been the subject of much dispute. Many cases exhibit an intense toxaemia, with jaundice, albuminuria, perhaps suppression of urine, and black vomit. Some of the local medical practitioners deny the contention of the Rockefeller Commission, sent out to study the condition, that it is yellow fever. The author maintains the view that the diseases are distinct. He has examined blood from 100 cases and failed to find the leptospira and inoculation of guineapigs has yielded persistently negative results. He states that he has always been able to obtain spirochaetes by withdrawal of 10 cc. of the patient's blood into citrated Ringer's solution, but that he has not succeeded in cultivating them. These spirochaetes are of varied size; the larger are present in cases exhibiting symptoms like those of yellow fever, the smaller in those who have neither jaundice nor albuminuria. The latter patients, however, often relapse, whereas the former do not. Further, agglutination of the *Leptospira icteroides* was not obtained with serum from the patients. The author seems to regard the disease as a variety of relapsing fever [see this *Bulletin*, Vol. 20, p. 911].

H. Harold Scott.

SLEEPING SICKNESS.

CARPENTER (G. D. Hale). **Report on an Investigation into the Epidemiology of Sleeping Sickness in Central Kavirondo, Kenya Colony.**—*Bull. Entom. Res.* 1924. Nov. Vol. 15. Part 2. pp. 187–208. With 1 fig. 1 folding map & 1 plate. [1 ref.]

FISKE had suggested that investigation of present conditions on the east coast of Lake Victoria in the central Kavirondo country would throw light on the etiology of the sleeping sickness and help reclamation of the abandoned territory in Uganda, and he further stated that it would be found that a number of *Glossina palpalis* represented by a catch of ten males per fly-boy per hour would be the limit of safety if there was a population of over thirty per square mile living in contact with the fly along the coast.

It was to test these theoretical conclusions and to obtain information on other points that the investigations recorded in this paper were undertaken.

The following summary and conclusions are given :—

" The epidemic of sleeping sickness in Central Kavirondo was introduced about 1903 from Usoga across a chain of islands, and finally from Mageta Island to the coast of Kadimu close by. Mageta was evacuated, and subsequent return of the population brought back the disease, leading to a second evacuation, second return, and renewal of the disease about 1920-21, leading to final evacuation two years ago.

" *Glossina palpalis* occurs plentifully along the 100 miles of coast examined, between the Sio River and the mouth of the Kavirondo Gulf, except just south of Sio, and in the neighbourhood of the mouths of the Yala and Nzoia Rivers. Ample evidence was obtained that non-mammalian blood is much preferred to that of the hippopotamus, which was the only source of mammalian blood, except man and cattle at some localities.

" No trypanosomes of mammalian type were found in 238 *palpalis* examined.

" *Glossina brevipalpis* occurs in the neighbourhood of Kadimu Bay frequenting the places where hippos sleep in the dense bush. In strong contradistinction from *palpalis,* they much prefer the blood of hippos to that of birds or reptiles. Ample evidence was obtained that in former days the population lived and cultivated along the lake shore in very much closer contact with *palpalis* than at present. The people of their own accord have retired from the lake shore, and only at a few localities is there contact with *palpalis* at watering and landing places, but a great deal of fishing is done all along the coast. There is a desire to return nearer to the water, and this will need watching lest the breadth of contact between fly and people be raised to danger-point. It must be remembered that absence of population for many years has resulted in very dense growth of bush in the country within a mile of the water, and that *palpalis* is possibly even more numerous now than formerly. In view of the absence of *palpalis* behind broad belts of papyrus the population should be encouraged to return to those parts in preference to others, *e.g.*, the northern part of Kadimu Bay and the bay running eastwards from the south of Kadimu Bay. Elsewhere safety may be conferred on the general population by clearing all landing and watering places for 200 yards along the coast on each side of the actual landing, and for 50 yards back from the water. To ensure that infected fishermen do not carry the disease from one place to another a system of licences, only valid after certification that the applicant is free from signs of sleeping sickness, could be adopted.

"It was not found practicable to examine the lake shore population systematically, nor was it considered expedient, for several reasons, to clinch diagnosis by gland puncture. After the existence of trypanosomes in the first case had been thus proved diagnosis depended upon palpation of cervical and axillary glands. No cases were seen so advanced as to be obvious to the eye alone, and the majority of the several cases diagnosed seemed in their own opinion in good health. Only two of the emigrants from Mageta Island showed tremors of the tongue and some degree of wasting. So far as could be ascertained by enquiry, the disease is quiescent at the present time, the only deaths reported being among the Mageta people who had come away two years ago.

"The presence of these infected people in a settlement on the mainland in close contact with Jaluo natives of whom none have acquired the disease is strong evidence that agents other than *Glossina* are not of material importance in the epidemiology of the disease. It was thought possible at one locality named Ndiwo, where *Glossina* was reported to be unknown, that sleeping sickness must have been carried by some other agent, but close attention to local conditions and their history in the past showed that there was ample evidence that at the time of the epidemic *palpalis* was probably there in adequate numbers, although barely able to exist at the present day.

"The population was found to be living so as to be in contact with *palpalis* at landing and watering places in 20 localities along the 100 miles of coast examined, but in three of these (24, 49, 56) the degree of contact was so doubtful that it is better not to consider them. In one locality (Maresa) the cases were, with one exception, probably old infections before leaving Mageta Isle, or else due to recent visits to that Island; the exception was probably infected owing to residence in a densely fly infested area close to the water during the famine period and may very possibly have been infected by the cyclical method.

"In three of the other localities where infection was discovered (these are all italicized in the list of localities), the relations between the population within 1½-2 miles of the water, estimated as adults per square mile (P), and the number of fly estimated by the catch of males per boy hour (F), are given below as P : F.

Locality 14	P : F :: 50 : 24.
,, 61	P : F :: 54 : 20.
,, 64	P : F :: 81 : 16.
Mageta Isle	P : F :: 42 : 30.

"The data for Mageta Isle are those of the last epidemic, which began probably in 1919, and was seen by Dr. Beven in 1921-22. In Locality 66 the infection was probably not acquired at the general landing and watering place.

"The four cases above cited therefore seem to show that broad contact between a population of density over 40 per square mile and *palpalis* at the rate of more than 15 males per boy per hour conduces to infection by *T. gambiense.*"

[It has to be noted that the dates given by Carpenter in his account of the history of the great epidemic in Central Kavirondo do not agree with those given in 1903 by CHRISTY.* CHRISTY estimated the dates at which the epidemic reached the various places to be as follows:—

Some part of Busoga or Buvuma Island, 1896 (Dr. Hodges); Kampala (Mengo), February, 1901; Southern Kavirondo, October, 1901;

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* CHRISTY (Cuthbert). The Epidemiology and Etiology of Sleeping Sickness in Equatorial East Africa, with Clinical Observations. *Repts. of the Sleeping Sickness Commission. Royal Society.* 1903. Nov. No. III (6). pp. 3-32. With 5 maps and 4 plates.

Sese Islands, December, 1901; Kasagunga, January, 1902; Lusinga Island, March, 1902; Kasachonga (Homa), March, 1902; Kisengere, ? May, 1902; German East Africa, September, 1902.].

W. Yorke.

AUGAGNEUR (Victor). **Le mouvement de la population en Afrique équatoriale française. Influence de la maladie du sommeil.**—*Rev. d'Hygiene.* 1924. June. Vol. 46. No. 6. pp. 509–540.

This paper deals in an extended form with the matter already discussed in a previous paper and noticed in this *Bulletin* [Vol. 21, p. 373].

1. There is nothing to support the belief that the population of French Equatorial Africa is in a state of diminution, especially since the commencement of French colonization.

2. The climatic conditions, the inadequate dietetic resources, the total absence of hygiene and of all foresight have for all time and especially before colonization, limited the growth of the population.

3. The numerous and conscientious observations made with meritorious zeal by the medical men who have studied trypanosomiasis do not permit of the formation of any definite opinion :—

(*a*) On the death rate of trypanosomiasis in relation to the total population.

(*b*) On the mortality in trypanosomiasis.

(*c*) On the spontaneous evolution of the epidemic.

4. It appears that after an initial attack en masse of a population hitherto free, the epidemic has exhausted a portion of its pristine power.

5. The influence of trypanosomiasis on the birth rate is not established.

6. The solution of these questions remains undecided and can be obtained only by examination at intervals of the total population of a given area, in which the death rate and the mortality from various causes are constantly supervised and determined.

The author, who is Governor-General of French Equatorial Africa, has instructed the Director of the Sanitary Service to devise an organization whereby a precise study of the progress and effects of trypanosomiasis may be made.

W. Y.

BULLETIN DE LA SOCIÉTÉ DE PATHOLOGIE EXOTIQUE. 1924. June 11. Vol. 17. No. 6. pp. 424–433.—**Prophylaxie de la maladie du sommeil.**

In this report a Committee appointed by the Société de Pathologie Exotique and consisting of ABBATUCCI, BOYÉ, BRUMPT, CALMETTE, CLAPIER, GONGIEU, GUILLET, JOYEUX, LEGER, MARCHOUX, G. MARTIN, L. MARTIN, MESNIL, NATTAN-LARRIER, OUZILLEAU, ROUBAUD, and the Governor LAMBLIN record the modifications which they consider should now be made in the recommendations contained in the previous report of 1920 [this *Bulletin*, Vol. 16, p. 362].

The following are the resolutions :—

1. Diagnosis should depend on the microscope and not be merely clinical; in practice it should be established by examination of gland juice, but good organization should allow also of the blood centrifugation method and of lumbar puncture.

2. The population of the various regions should be visited periodically and diagnosis should be made as early as possible if only because it permits of more efficacious treatment.

3. For cases in the first stage 6 injections of atoxyl, each 1·5 cgm. to 2·0 cgm. per kilo of body weight should be given at intervals of 10 days every year. Such treatments occupy 50 days and give only 6 per cent. of relapses in 12 months. Sterilization of cases in the second stage must be attempted with circumspection.

4. The present prophylactic sectors are too large and they should be subdivided.

5. This demands an increase in the number of doctors and they should be encouraged both morally and financially in a measure commensurate with their dangerous task. An increase in the number of European hospital assistants is likewise necessary.

6. Native hospital assistants should only be used prudently and should be under strict supervision.

7. The mobility of the medical personnel should be increased and facilitated by modern means of transport.

8. The attention of the Administration should be urgently drawn to the fact that agricultural and administrative measures are just as important as therapeutic prophylaxis, and without them the latter remain aleatory and uncertain. The Society insists once more that ideal prophylaxis consists in :—

a. Rendering each place of concourse healthy by protecting it from the sources of infection (tsetses and mosquitoes).

b. Reassembling, on routes of communication readily accessible, native agglomerations dispersed in the equatorial forest and difficult of supervision.

c. Improving the dietary (notably by assisting in the importation of dried foods) and the general welfare of the population.

9. The Administration and Sanitary Service should co-operate in arranging a programme and in determining the regions which should for various reasons benefit first from an intensified prophylactic campaign.

10. An obligatory course of instruction relating to prophylaxis of human and animal trypanosomiasis should be given at the Colonial School to students destined for the African tropical Colonies. The administrators of the infected regions should receive practical instruction on the voyage to Brazzaville, Libreville or Douala.

11. With the object of facilitating prophylaxis the doctor should be able to appeal for the co-operation of Europeans (officials, officers, missionaries and colonists).

W. Y.

BLANCHARD (M.) & LAIGRET (J.). **Sur la prophylaxie de la maladie du sommeil. À propos de la Mission Schwetz au Congo Belge.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 485–501. [8 refs.]

The authors state that the Sleeping Sickness Commission directed by SCHWETZ in the Kwango district of the Belgian Congo [this *Bulletin,* Vol. 15, p. 381 and Vol. 21, p. 371] laid down certain principles of organization and methods of diagnosis and treatment which deviate notably from those followed by them in their work in French Equatorial Africa. In this paper they consider: (1) The methods of diagnosis employed by SCHWETZ; (2) his treatment, and, more particularly, the accidents due to the use of atoxyl which he records; and (3) the organization of SCHWETZ's mission, its functioning and the lessons which can be drawn for work in French territory.

With regard to SCHWETZ's contention that gland palpation alone, without puncture or blood examination, is sufficient to diagnose trypanosomiasis, the authors definitely disagree. The chief argument employed by SCHWETZ in support of his method is that the glands in trypanosomiasis are absolutely characteristic and totally different from those found in syphilis, tuberculosis, or inflammatory conditions. The authors agree that this is so in general, but point out that trypanosomes may sometimes be found in atypical glands and, on the contrary, typical glands may be present in cases not infected with trypanosomiasis.

SCHWETZ holds the view that microscopic diagnosis is uncertain in negative cases, but Blanchard and Laigret do not agree with this; they consider that with the means of investigation available, viz., microscopic examination of gland juice, the blood centrifugation method or, in certain cases, spinal puncture, the result obtained at the first examination can be regarded as final. Again, in this connexion the authors state that in treated cases the enlarged glands disappear and disappear finally, even though the patients pass into the second stage of the disease with the appearance of parasites in the cerebrospinal fluid.

Summarizing their views on the question of diagnosis of trypanosomiasis in the bush, Blanchard and Laigret believe that the method of gland palpation should only be regarded as a *pis aller.* Only the microscopic method of investigation can be regarded as certain and fortunately in trypanosomiasis the examination of gland juice and centrifuged blood are relatively simple.

With reference to the question how infected natives should be treated in the bush, the authors remark that SCHWETZ used two drugs—atoxyl and emetic. The former was employed in the massive doses of 1 gm. for adults and ·5 gm. for children. Blanchard and Laigret state that these are the only efficacious doses, that they themselves have frequently used 1·2 gm. in adults and ·6 gm. in children; such doses are well tolerated by persons whose spinal fluid is normal. They ascribe the accidents recorded by SCHWETZ as due either to a poor quality of drug or to the fact that certain of SCHWETZ's cases were in the second stage of the disease, it being impossible to exclude all such cases in absence of spinal puncture. Subcutaneous injections are, in the authors' opinion, to be preferred to the intravenous injections recommended by SCHWETZ.

Blanchard and Laigret do not care for emetic as a remedy for use in the field, the lesions produced by faulty technique are difficult to deal with and they consider that, although it is an excellent trypanocide in animals, it is much less active in man.

In the French territory, the prophylactic courses consist of two injections at 8 to 10 days' interval, whereas SCHWETZ gives ten injections. The French method is based on the view that the doctor should travel as rapidly as possible over an extensive area and not attempt at obtaining cures. The object is to repeat the course of treatment every 6 months or even every 3 months, but in practice in most of the districts it is only possible to renew the treatment once a year. Investigation has shown the inadequacy of the French method, it has cured a certain amount of cases as perhaps would also a single injection, but the great majority of patients relapse. Experience at Brazzaville has shown that a course of 6 massive injections gives only 6 per cent. of relapses after a year's post-treatment observation, and that 90 per cent. of the cases appear to be cured, whilst after a prophylactic course of only 2 injections 29 per cent. are found not to be cured after a year's observation, and 17 per cent. have relapsed within six months. The authors believe that the French procedure is erroneous and that the organization should be remodelled in directions which they indicate at length.

W. Y.

TANON (L.) & JAMOT (E.). **La maladie du sommeil au Cameroun.**—*Presse Méd.* 1924. Aug. 23. Vol. 32. No. 68. (Supplément) pp. 1427–1431. With 1 fig.

Although the French found the situation as regards sleeping sickness to be aggravated at the end of the war, they have been able to devise an organization which has enabled them to check the epidemic and even in certain places to cause it to retrogress. This paper deals with the work being done in the Haut-Nyong sector created in 1920, and comprising the sub-divisions of Akoloninga and Abong M'Bang on the Nyong and the sub-division of Doumé. The medical centre is at Ayos in the most heavily infected part of the sector. The region north-east of Doumé has been made into a sub-sector confided to the care of one doctor and two hospital assistants—the one stationed at Garoua and the other at Douala.

The medical centre at Ayos is excellently situated on a plateau 600–700 m. high ; the temperature varies between 22°C. and 25°C. and the prevailing winds render it pleasant. A description is given of the medical staff, of the general organization, and of the prophylactic measures which are being adopted. The treatment used chiefly is the administration of atoxyl, which cures the patients in the first stage of the disease and renders harmless the most advanced cases. The first injection consists of about 1·5 cgm. per kilo of body weight (about 1 gm. for an adult). This dose suffices to cause parasites to disappear from the blood for several months, and then the patient should receive (HUOT) ·5 cgm. per kilo every seven days until he has had 15 to 20 injections, but in practice this is impossible owing to the limited staff available. One has to content oneself with giving injections at monthly intervals or as often as possible, according to the method recommended by AUBERT—4 injections of atoxyl each of 1 gm. at 8-day intervals supported by two injections of novarsenobenzol, which is sometimes replaced by emetic.

By this means, it is estimated, the numbers of carriers is reduced by 90 per cent., and many of those in the first stage are cured. Since the commencement of operations in January, 1920, about 100,000 natives have been examined and 30,000 recognized as infected. The infectivity varies in the different regions—at Abong M'Bang it is 26 per cent., at Akoloninga 48 per cent., Doumé 8 per cent., and in the other places less. The death rate has fallen considerably and the foci at Akoloninga and Doumé are on the way to extinction.

W. Y.

KOCH (Robert). **Ein Tagebuch von Robert Koch während seiner deutschostafrikanischen Schlafkrankheits-expedition i. J. 1906-07. Vorbemerkungen und Erläuterungen von Prof. F.** KLEINE. [Robert Koch's Diary during the Sleeping Sickness Expedition to German East Africa in 1906–07].—*Deut. Med. Woch.* 1924. Jan. 4, 11, 18, 25, Feb. 1, 8, 15, & 22. Vol. 50. Nos. 1, 2, 3, 4, 5, 6, 7 & 8. pp. 21–24; 55–56. With 1 text fig.; pp. 88–89. With 2 text figs,; pp. 121–122. With 1 text fig.; pp. 152-153; 184–185; 216–217. With 1 text fig.; pp. 248-249.

This diary is edited by Professor F. KLEINE, who gives a short account of the circumstances in which the diary was kept. In 1906 the German Government sent to East Africa a medical expedition for the study of sleeping sickness under the leadership of Professor Koch. He was accompanied by his wife, Professor Beck and Professor KLEINE. In Africa three other medical men joined him.

At that time the epidemiology of sleeping sickness was still not altogether clear; the mode of infection by *Glossina palpalis* had not been explained, although BRUCE had found this fly to be the carrier of *T. gambiense*. Also, *G. palpalis* was at that time regarded as the sole carrier of the disease. Koch's aim was to discover more about the bionomics, especially the food supply, of *G. palpalis*, and to find out whether man was the only host of *T. gambiense*. The ultimate aim of the expedition was that of finding practical methods of prophylaxis against sleeping sickness. Koch placed great hopes in the blood sterilizing properties of atoxyl, and even when these hopes were not altogether realized, believed that the only satisfactory means of stamping out the disease would be by the discovery of a drug that would keep the blood of the infected free of trypanosomes for a sufficient length of time.

KLEINE, who was himself a member of the expedition, points out that the diary is quite impersonal and contains no remarks about any of the members of the expedition, or any hint of Koch's personal feelings whether of elation or disappointment. No mention is made of the difficulties he met with, or of the privations he had to undergo. The entries are concise statements of fact.

Koch's official report of this expedition was published in the *Deut. Med. Woch.* in 1906 and 1907 and also in his collected works, Vol. II. The diary itself is a small note-book with the entries in pencil and is in the possession of his widow.

W. Y.

TODD (John L.). **After-History of African Trypanosomiasis.** 1911–1924. [Correspondence.]—*Brit. Med. Jl.* 1924. Aug. 16. p. 298.

Todd writes that from letters he has received from the Gambia, it may be concluded that 8 natives, who were found by WOLBACH and himself* to be infected with trypanosomes in 1911, were in good health in 1920, and that one of these cases—nothing is known of the others—was still alive in 1924, and had never shown a sign of "sleeping sickness." The author continues:—

"The history of these cases permits the definite statement that either human trypanosomiasis may be an extraordinarily chronic infection or that spontaneous recovery from the disease may not uncommonly occur in African natives of the Gambia. The situation is one which can be clarified by the continued observation and examination of cases over long periods. To do so is, therefore, a work which can only be undertaken by a permanent authority."

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* *Ann. Trop. Med. & Parasit.* 1911. Vol. 5. pp. 245–86; see *Sleeping Sickness Bulletin*, Vol. 3, p 336.

W. Y.

CHAGAS (Carlos). **American Trypanosomiasis. Study of the Parasite and of the Transmitting Insect.**—*Proc. Inst. of Med. Chicago.* 1921. Vol. 3. No. 4. pp. 220–242.

This is a summary of the present state of knowledge regarding American trypanosomiasis, and requires little notice here. With regard to the development of the parasite in the invertebrate host, Chagas holds the view that the forms in the hind gut do not constitute the last stage of evolution of the trypanosome; these are found in the salivary glands. He writes:—

> "This discovery has been a difficult one, and up to the present has been realized rarely; however, its importance is not less as being demonstrative of the exact mechanism of transmission of the parasite. In the salivary glands the parasite has been seen in the interstitial tissue between the glandular cells. Here it is elongated, with a rodlike nucleus placed longitudinally, with much smaller dimensions than the forms of the hind-gut, with which it cannot be confused. This is the final stage of the exogenous cycle of the parasite equivalent to the sporozoites of malaria and of other protozoa transmitted by hematophages"

In contradistinction to the views of BRUMPT and others, Chagas believes that,

> "As a result of decisive experiments and observations we can express the firm opinion that the natural transmission of *Trypanosoma cruzi* is accomplished by the bite of the triatome. The feces may constitute an accidental factor in the transmission of the parasite when they are deposited directly on the mucous membranes; however, if the defecations of the insect take place on the intact skin the penetration of the parasite does not occur, principally on account of the death of the flagellates by the desiccation of the feces."

W. Y.

i. VILLELA (E.). **Paralysie expérimentale chez le chien par le *Trypanosoma cruzi*.**—*C. R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30. pp. 979–983. With 4 figs.

ii. CAMPOS (Ernesto de Souza). **Sur la paraplégie des animaux infectés expérimentalement par le *Trypanosoma cruzi* (Chagas 1909).**—*Ibid.* pp. 984–985.

i. A strain of *T. cruzi* obtained from a naturally infected armadillo proved very virulent when passed through a series of dogs, the animals dying in from 25 to 50 days after inoculation. The frequence of nervous symptoms was very interesting—staggering, tonic and clonic convulsions, followed sometimes by prolonged coma and paresis of the limbs. In the series of dogs, palsies appeared regularly in about 30 days. Other interesting points were the frequence of keratitis and the localization of the parasite in the nervous system. An account is given of the pathological changes met with, and attention is drawn to the fact that infiltration of the leptomeninges and of the arterioles similar to that noted in other trypanosomiases was the rule.

In a note at the end of the paper the author records that one of the animals gave birth to nine pups, all of which were still-born and some very macerated. In five of them *T. cruzi* was found in the blood and the heart showed leishmaniform agglomerations; in the brain foci of encephalitis were found. This observation is interesting and is in accordance with the numerous cases of congenital encephalitis seen in Chagas' disease.

ii. Details are given of a number of experimental animals—5 dogs and 2 rabbits—which exhibited nervous symptoms, similar to those observed by VILLELA, after inoculation with *T. cruzi.*

W. Y.

PINTO (Cesar). **Sobre um Reduvideo transmissor do** "*Trypanosoma cruzi.*" *Sciencia Medica.* 1924. Aug. 31. Vol. 2. No. 8. pp. 426-427. With 1 fig.

In 1872 STÅL described *Rhodnius pictipes* as existing in the State of Rio Grande do Norte, and DA MATTA found it also in Manáos (State of Amazonas). NEIVA and Pinto in 1923 showed that it is naturally parasitized by *Trypanosoma cruzi* and that it can act as a transmitter of this protozoon. The cycle of evolution under laboratory conditions occupies just over a year; oviposition occurred on April 30th, 1923, the larva emerged on May 14th, and the adult on May 10th, 1924.

H. Harold Scott.

BRENNAN (C. H.). **The Serum-Aldehyde Test as applied to Trypanosomiasis.**—*Kenya Med. Jl.* 1924. June. Vol. 1. No. 3. pp. 79–81.

The author applied the serum aldehyde test in 10 cases of trypanosomiasis and in 7 normal persons; all the former gave a positive reaction and all the latter were negative.

W. Y.

VAN DEN BRANDEN (F.). & VAN HOOF (L.). **Le " Bayer 205 " dans le traitement de la Trypanosomiase humaine.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 205–230. [2 refs.]

The patients treated by the authors are grouped in two categories: (1) those in the first stage of the disease, with fever, enlarged glands and less than 15 lymphocytes per cmm. in the spinal fluid, and (2) those in the second stage exhibiting a meningeal reaction indicative of profound changes in the nervous system.

It was found that "Bayer 205" is an energetic trypanocide and that the action is slow. Sterilization of the blood is more rapid in patients injected intravenously than in those injected intramuscularly or subcutaneously. In patients in the first stage of the disease a course of 3·5 gm. (4 injections, the first 0·5 gm. and the others 1 gm. at 6–8 day intervals) produced a sterilization of the blood lasting 5 to 16 months in 12 of the 19 treated; of the remaining seven cases one died, one disappeared, and the other five relapsed.

The drug no more cured patients in the second stage of the disease than does atoxyl and the clinical benefit resulting is less marked than from the latter drug. In all, 25 such cases were treated; in 13 the drug was given intravenously, in 3 it was given both intravenously and intrathecally and in the remaining 9 intravenously and the

"Bayer 205" serum injected intrathecally. Of the 13 in the first group 6 are dead within the observation period mentioned, 1 has relapsed, and the other 6 have remained in good general condition with negative blood, but the lymphocytosis in the spinal fluid has increased. The results obtained in the 3 cases in which the drug was injected intrathecally were very unsatisfactory and showed that such a procedure is attended by grave risk to the patient; the therapeutic value is apparently nil. It was found that the injection of "Bayer 205" serum intrathecally is not irritating to the meninges, but that the combination of this with intravenous injection of the drug is not superior to intravenous injection alone.

The sterilization of the blood produced by a single injection of 1 gm. of the drug may be very long in patients in the second stage of the disease, although their infection persists; and in this respect "Bayer 205" is a therapeutic agent of very great value.

The authors noted as an immediate reaction in the patients treated a cutaneous eruption in the form of urticarial plaques and a herpetic eruption about the lips, and as a later reaction renal irritation proceeding in certain cases to nephritis.

The paper concludes with five tables showing, respectively, the speed with which sterilization of the gland juice occurs, the result of treating patients in the first stage of the disease with 3·5 gm. of the drug, and the results of treatment in the second stage of the disease (1) with intravenous injections of the drug, (2) with intrathecal injections of the drug, and (3) with intravenous injection combined with intrathecal injection of "Bayer 205" serum. Information is given regarding the dose of the drug administered, the state of the cerebrospinal fluid before and after treatment, whether or not a relapse occurred, the state of the urine, and the clinical effect of the treatment, etc.

W. Y.

TANON (L.) & JAMOT (E.). **Essai de traitement de la maladie du sommeil au Cameroun par le "Bayer 205." Action sur les parasites. Action sur les reins et le foie.**—*Ann. Parasit. Humaine et Comparée.* 1924. Oct. Vol. 2. No. 4. pp. 327–334.

The patients came from a village of Abong-M'Bang. Thirty-nine were chosen for treatment, all of whom presented signs of trypanosomiasis and in whom examination of the gland juice and blood revealed the presence of trypanosomes. The patients were divided into the following four classes:—

1. Those who exhibited all the clinical signs of the first stage with trypanosomes in the blood and cerebrospinal fluid normal (13 patients). *First stage.*
2. Those who had a slight infection of the meninges indicated by a slight lymphocytosis and a little excess of albumose (12 patients). *Commencement of the second stage.*
3. Those who had a marked lymphocytosis with excess of albumose and trypanosomes in the cerebrospinal fluid (6 patients). *Second stage confirmed.*
4. Those who exhibited a marked degree of emaciation, cachexia, somnolence and the nervous disturbances which characterize the *third stage* (6 patients).

The patients were of both sexes and varied in age from 6 to 40 years.

The amount of the drug given to each patient was about 3 gm. and it was administered in one of two ways, either in three doses of ·5 gm., 1 gm. and 1·5 gm., respectively, at intervals of two days, or in two large doses of 1·5 gm. each at an 8-day interval. The children were given smaller quantities, those of from 6 to 10 years getting ·2 gm. and ·4 gm., those of 10 to 13 years ·5 gm., ·7 gm. and 1·0 gm. The earlier injections were given subcutaneously and the later intravenously. In two cases it was given intrathecally with fatal results.

The trypanosomes began to disappear from the blood after 3 hours, after 18 hours they could not be found in the great majority of the patients and in none could they be found after 24 hours. In 30 of the patients there was no relapse in 9 months, but in 7 relapses were observed, for the most part transitory. One case relapsed on the 24th day, but on the 26th day the parasites disappeared permanently; one case relapsed on the 17th day and parasites persisted for 4 months and then disappeared; two other cases relapsed on the 17th day and trypanosomes persisted for 5 months and then disappeared; one case relapsed after 5 months and another after 6 months, parasites persisting for a month and then disappearing; and in the last case a relapse occurred after 1½ months, parasites persisted for 15 days and then disappeared to reappear again after 2 months.

The trypanosomes are not then all destroyed immediately, but may reappear after intervals, again to disappear; only exceptionally do they reappear to persist. The autoagglutination of the erythrocytes is in no way modified.

With regard to the effect on the cerebrospinal fluid the authors state that this remains unchanged; the trypanosomes persist, the lymphocytosis and hyperalbumosis is uninfluenced.

The drug always produces albuminuria, which varies in intensity. This is dependent on a direct action of the drug on the renal epithelium; the albuminuria persists for several months, is augmented by fatigue, and may even lead to a manifestation of renal insufficiency. An account is given of the pathological lesions found in two fatal cases.

W. Y.

LUENGO (E.) & DE BUEN (S.). **Pouvoir trypanolytique du sérum d'un malade traité par le " Bayer 205."**—*C. R. Soc. Biol.* 1924. Oct. 7. Vol. 91. No. 28. pp. 825–827.

The authors have examined MAYER's conclusions [see this *Bulletin*, Vol. 17. pp. 334–5] that the serum of sleeping sickness patients treated with " Bayer 205 " contains the drug for long periods, that it exhibits a curative action for infected animals and also a preventive action for the patients themselves, and finally they have enquired whether these properties are exhibited by healthy animals to which the drug has been given.

They used the serum of a patient who had received a total of 8 gm. of " Bayer 205 " in three series at intervals of 15 days; the last injection was given 1½ months previously. The day before the removal of the serum the patient had a slight rise of temperature accompanied by the appearance of trypanosomes in the peripheral blood, but parasites were not found on the day of withdrawal of the serum or on the following day. About 15 days after each series of injections he had a slight rise of temperature lasting about two days and accompanied by the appearance of trypanosomes in the blood. Inoculation of the blood into a guineapig and dog was, however, negative.

Mixtures of ordinary bouillon with the various sera, solutions of the drug, and the blood of a heavily infected guineapig were injected into the peritoneal cavity of white mice and drops subsequently withdrawn and examined after stated intervals; as a control *in vitro* observations were also made.

The authors conclude from their experiments that the trypanocidal action of the treated patient's serum was not due solely to the action of the contained drug, but to properties acquired by the serum as the result of destruction of the trypanosomes. The trypanocidal activity of the serum undergoes certain oscillations, thus accounting for the transient appearance of parasites in the blood of the patient at certain intervals followed by their spontaneous disappearance.

If the existence of these processes of immunization are proved it will be necessary, in order to cure trypanosomiasis with " Bayer 205," to proceed in such a manner as to excite this action and not to aim at a chemical sterilization, but rather at a progressive destruction of the trypanosomes by a sort of auto-vaccination resulting from the proper spacing of the injections of the drug.

W. Y.

STONES (R. Y.). **A Case of Sleeping Sickness treated with Bayer 205.**—*Kenya Med. Jl.* 1924. Oct. Vol. 1. No. 7. pp. 209–212.

The patient, a native, was admitted to hospital with a diagnosis of anaemia of unknown cause on 29 March, 1924. Examination of the stools showed the presence of *Taenia saginata*; treatment was administered, but was not successful. Examination of the blood was negative and small doses of neosalvarsan were then given. Later, as there was no improvement in the anaemia, the patient received a course of arsenic. On 25 April the diagnosis was reconsidered, two small glands were noticed and, on puncture, trypanosomes were discovered. A course of tartar emetic was then given, but on 10 May trypanosomes were still present in the gland juice, but were not found in the blood. On 13 May 1 gm. of Bayer 205 was given and the dose repeated on 19 May; on 21 May trypanosomes were found in the gland juice and albumen was detected in the urine. On 29 May the patient had improved and only a cloud of albumen was found in the urine; on 5 June ·5 gm. Bayer 205 was given, on 13 June the gland juice was negative and the urine contained albumen, on 27 June a further injection of 1 gm. of Bayer 205 was given and the patient collapsed; he was revived by stimulants, but suppression of urine set in and he died in about 40 hours.

W. Y.

LETONTURIER, DE MARQUEISSAC & JAMOT. **Essai du tryparsamide dans la trypanosomiase humaine à virus gambiense.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 692–703.

Details are given concerning fourteen cases of trypanosomiasis treated with tryparsamide; of these one was in the first stage of the disease, 3 at the beginning of the second stage, 6 definitely in the second stage, 3 in the third stage and 1 was a very advanced demented case.

Each patient received only a single series of subcutaneous injections (owing to the small quantity of the drug available); the dose given was ·04 gm. per kilo of body weight and was repeated every 6 or 7 days; the total dose varied from 10 gm. to 21·5 gm.

Seven of the patients developed albuminuria in the course of treatment; in 5 it was transient, but in 2 it was severe and caused the treatment to be interrupted. No serious ocular troubles were observed. Subcutaneous injections (10 per cent. solutions) caused neither pain nor irritation; one case developed an abscess, but this was attributed to imperfect sterilization of the syringe. Thick blood films were examined regularly during treatment and the subsequent sojourn of the patients in camp. Only 2 cases relapsed, one after 19 days and the other after 15 days. [It must be noted, however, that the post-treatment observation period was at most only a few months]. The treatment, however, led to a pronounced reduction of the cells in the cerebrospinal fluid of the patients in the second stage of the disease and to a marked amelioration of the nervous symptoms in those in the third stage. All the patients have considerably improved.

W. Y.

CHESTERMAN (Clement C.). **Tryparsamide in Sleeping Sickness. II.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 131–137. [7 refs.]

This paper gives later information regarding the fate of the 40 cases of sleeping sickness—all advanced and in the later stages of the disease—treated with tryparsamide [see this *Bulletin*, Vol. 20, p. 694].

As in the former paper the cases are considered under three headings:—

1. Twenty-four which had had no previous treatment.
2. Ten which had been treated previously with atoxyl, tartar emetic, etc.
3. Five of 6 patients who had survived treatment by intrathecal serum (MARSHALL'S treatment).

Details regarding the fate of the 24 cases belonging to the first group are given in a table wherein is recorded the amount of tryparsamide given (from 10 to 28 gms.), the condition of the spinal fluid before and after treatment and the result and length of post-treatment observations. In 5 of the cases an obviously excellent clinical condition was confirmed by the discovery of a normal cerebrospinal fluid 22 to 29 months after treatment. The condition of the cerebrospinal fluid of these 5 cases before treatment was as follows:—Case 40, no record; Case 73, 470 cells + tryps.; Case 113, 420 cells − tryps.; Case 115, 540 cells + tryps.; Case 150, 760 cells + tryps. One case (No. 72) was seen on itineration and was in excellent health; one (No. 212) was also in good condition after 20 months, the blood was negative (triple centrifugation) and the cerebrospinal fluid contained 12 cells as against 170 before treatment. Two cases (Nos. 146 and 203) are reported to be well and one (No. 208) has disappeared. The remaining 14 uncured cases fall into 2 categories, viz., those which were discharged after the first course while the cerebrospinal fluid was still not normal, *i.e.*, immediate failures, and those in which the cell content was normal at that time, *i.e.*, immediate successes. The former are referred to as non-cures and the latter as relapses. Of the 5 non-cures (Nos. 131, 136, 157, 163 and 170) Nos. 131 and 136 were given weekly 1 gm. and 2 gm. doses respectively, and these doses are now known to be inadequate; No. 157 attended very irregularly and received only 2 gm. doses; No. 163 evidently should have received a second course, as he tolerated the drug well and was not clear after 24 grammes. Of the 9 relapse cases (Nos. 44, 45, 138, 139, 165, 171, 173, 174 and 199) three apparently received too small a dose of the drug.

Briefly the single course of treatment, which in many of the 24 cases was undoubtedly inadequate, has resulted, after approximately 2 years' average observation, in 9 (37·5 per cent.) apparent cures, 5 (21 per cent.) non-cures—2 being dead, 9 (37·5 per cent.) relapses—3 being dead and 1 (4 per cent.) untraced.

The author states that the only results with which these can be compared are those recorded by VAN DEN BRANDEN and VAN HOOF who followed up the cases originally treated by PEARCE at Leopoldville [this *Bulletin*, Vol. 21, p. 376]. Of the 35 patients who shewed altered cerebrospinal fluid before treatment, 16 (45·7 per cent.) were still normal and 19 (54·3 per cent.) were not normal after an average observation period of 7 months.

With regard to the second group of ten cases which had previously been treated with atoxyl, tartar emetic, etc. and in which these drugs had ceased to have any beneficial effect, all showed clinical improvement after tryparsamide, but as was predicted in the former report, 7 of the 10 relapsed and 4 are dead. The author explains this on the hypothesis that the trypanosomes had become arsenic-fast, and furthermore because in certain cases it was impossible to administer suitable doses on account of pre-existing visual troubles. Details are given regarding the 3 which have not relapsed which are very encouraging.

The last group of cases comprise 6 treated by the intrathecal serum method of MARSHALL; all had relapses shortly afterwards and 2 had died before further treatment could be given. Of the 4 which survived and were treated by tryparsamide 3 are in excellent health and 1 is still receiving the drug.

The following summary is given :—

> "Fifteen out of thirty-seven patients, *i.e.*, 40·5 per cent., have remained well and without sign of relapse for periods averaging over two years from the end of a single course of treatment. Without exception they had all exhibited marked symptoms of involvement of the central nervous system, confirmed by an average cell content of the cerebrospinal fluid before treatment of 630 cells per c.mm. and the detection there of trypanosomes in six cases. Two or three were unable to walk, one was incontinent, and all long had passed the stage when there is any hope to be entertained of a cure by atoxyl and other drugs.
>
> "The failures are due, in many instances, to faulty or insufficient dosage, which did not, by any means, always result from a fear of amblyopia, although this factor operated in some cases.
>
> "The outlook is distinctly hopeful that one will, with the experience gained, be able to procure a greater percentage of immediate successes, and, given an opportunity for the administration of a second course shortly after the first, be able to prevent what appear to be true relapses. I am convinced that the curative power of tryparsamide in nervous infections is superior to that of 'Bayer 205.' Moreover, the high price of that drug ($15 for 10 grammes), exactly ten times as expensive for a single course as tryparsamide, will make it impossible to use on a large scale in Belgian Congo. The danger of nephritis which it causes is more serious and less easily detected in its early stages by the partially trained

white or black sanitary agent, than is the amblyopia which may ensue during the use of tryparsamide."

[The author is to be congratulated on this excellent paper. Whilst there are available innumerable records of the immediate effect of drugs on groups of sleeping sickness cases, there are remarkably few which throw light on the final fate of treated cases. It is to be hoped that it will be possible still further to observe these cases and that the author will in the course of another year or two publish further information regarding them.]

W. Y.

Raiziss (George W.). Severac (M.) & Moetsch (John). **The Chemotherapy of Sulpharsphenamin. I. Toxicity and Trypanocidal Efficiency.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 29. Vol. 83. No. 22. pp. 1734–1736. [6 refs.]

The authors tested the trypanocidal value of sulpharsphenamin on rats infected with *T. equiperdum* and compared the action with that of arsphenamin and neoarsphenamin.

The conclusions are :—

1. Whether we evaluate the drugs studied in this paper on the basis of the absolute weight of their respective minimum effective dose or on that of their arsenic content, we must conclude that much more sulpharsphenamin (or the corresponding French product, sulpharsenol) is required to sterilize animals infected with *Trypanosoma equiperdum*, than arsphenamin or neoarsphenamin. In the same series of experiments, it required about 18 mg. of sulpharsphenamin per kilogram to produce the results obtained with, approximately, 4 mg. of arsphenamin or 6 mg. of neoarsphenamin.

2. Taking the chemotherapeutic $\frac{\text{Maximum Tolerated Dose}}{\text{Minimum Effective Dose}}$ index as the criterion of therapeutic efficiency, sulpharsphenamin based on trypanocidal tests is considerably inferior to arsphenamin, and at most one-half as efficient as neoarsphenamin.

3. The trypanocidal efficiency of sulpharsphenamin is practically the same, whether administered intramuscularly or intravenously.

W. Y.

Uhlenhuth (Paul), Kuhn (Philalethes) & Schmidt (Hans). **Ueber ein neues trypanozides Antimonkomplexsalz (Heyden 661).** [On a New Trypanocidal Antimony Complex Salt (Heyden 661).]—*Deut. Med. Woch.* 1924. Sept. 19. Vol. 50. No. 38. pp. 1288–1289. [18 refs.]

The paper commences with a brief summary of the chemical constitution of the various organic compounds of antimony which have been used in the treatment of syphilis and trypanosomiasis. One of these, "Heyden 661," has a marked action in trypanosomiasis of mice. This drug is an almost colourless powder easily soluble in water, producing a neutral solution which bears the addition of ammonia or caustic soda without precipitation. Details are given of a number of experiments showing that 2 mgm. of the drug suffice to cure dourine-infected mice. The trypanosomes disappear from the blood within 2 or 3 hours of the injection.

W. Y.

RAMSIN (S.) & SCHNITZER (R.). **Zur Kenntnis der trypanoziden Wirkung des Antimons.** [The Trypanocidal Action of Antimony.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28 No. 11. pp. 471–479. [11 refs.]

The following are the conclusions :—

1. The trypanocidal action of stibenyl in experiments with mice infected with nagana is definitely less than that of tartar emetic (in the relation of 1 : 15). Its toxicity is also less (in the relation of 1 : 8–1 : 10) and the therapeutic index is somewhat less favourable.

2. In contrast to animals treated with tartar emetic those treated with stibenyl remained without exception relapse free. There is, therefore, in antimony compounds an antimutative action of which tartar emetic as such does not permit of recognition.

3. An arsenic fast strain which showed no resistance to tartar emetic was definitely fast to stibenyl. Resistance to emetic and resistance to antimony cannot therefore be regarded as identical. For the first time differences of avidity, depending on the constitution, analogous to what is known to be the case in the arsenic series, are seen in the antimony series.

W. Y.

VOEGTLIN (Carl), DYER (Helen A.) & MILLER (D. Wright). **On Drug-Resistance of Trypanosomes with Particular Reference to Arsenic.**—*Jl. Pharm. & Experim. Therap.* 1924. Vol. 23. pp. 55–86. With 2 figs. [30 refs.]

Acquired tolerance of poisons is one of those immemorially familiar mysteries into the secrets of which the authors of this most interesting paper seek to penetrate by the experimental route. Among numerous fairly well known facts mentioned in their prolegomena they put some emphasis on the fact that resistance to arsenic can be produced by certain orthochinoid dyes (acridin, oxazin, pyronin) having no obvious chemical relations with arsenicals. Of their numerous experiments one series shows that trypanosomes readily acquire an arsenic resistance if injected into rats that have previously been treated with arsphenamin. This resistance, it is noted, is transmitted to the progeny produced by fission ; it is persistent, and it shows that arsphenamin persists in the host's body for a long time and may be more conducive to the production of arsenic resistant trypanosomes than more easily excreted arsenicals like atoxyl. Another series of experiments shows that an arsenic resistance acquired and retained by trypanosomes in one species of animal host (rat) can be considerably lessened in that particular species of host by intervening passage through a host of another species (rabbit, dog). This phenomenon cannot be explained by a simple chemoceptor theory ; it points to a contributory participation of the host. In short, a real understanding of the nature of arsenic resistance of trypanosomes must be based on knowledge of the "mechanism" of the toxic action of arsenic on living protoplasm. As regards this mechanism it is known that the toxic action of arsenic on trypanosomes depends on the stage of oxidation of arsenic, the arsenoxide (R. As = O) being the highly toxic form. It is also known that the action of arsenoxide on trypanosomes is completely inhibited by the interaction of certain sulphydril compounds (glutathione, cystein). These sulphydril compounds, which are normal constituents of active protoplasm, have been shown to play an important part in cell respiration, and the cell must therefore be supposed to possess some means of regulating their function. "A working hypothesis of the mechanism of resistance is suggested which is based on the action of arsenic on the dynamic equilibrium of which glutathione is a component, and which regulates the respiration of protoplasm," a conclusion which seems to be not quite original.

A. Alcock.

ROSENTHAL (F.). **Die trypanociden Stoffe des menschlichen Serums, ihre biologische und klinische Bedeutung.** [The Trypanocidal Substances of Human Serum, their Biological and Clinical Significance.]—*Klin. Woch.* 1924. Sept. 9. Vol. 3. No. 37. pp. 1657-1660. [29 refs.]

LAVERAN, in 1902, demonstrated the trypanocidal action of the serum of man and of the higher apes, and the relative resistance of man to infection with trypanosomes as a whole was at first explained by this fact, but later observations were recorded which caused one to doubt the accuracy of this assumption. The serum of such relatively resistant animals as sheep, goats and pigs does not exhibit this trypanocidal action. Further, LAVERAN showed that the trypanocidal action of the primates' serum is in some way connected with coagulation, since human plasma had but slight action as compared with that of the serum. Either there must be present in the plasma limiting bodies which are eliminated in great part by coagulation or the trypanocidal action of human serum is due in great part to an artificial product which is not found in the circulating blood. Furthermore, human serum and that of the higher apes is not itself fatal to the trypanosomes, but only exerts a trypanocidal action when it is introduced into an organism of another species.

The trypanocidal action of the primates' serum has no parallel amongst the known normal antibodies of serum. It is inactive *in vitro* and it is not changed by the addition of leucocytes or organ cells, it is destroyed at 64° C. and not reactivated by the addition of complement; moreover, it is not related to the immune bodies produced in the course of subacute or chronic trypanosomal infections since trypanosome strains which have become serum fast are cured by normal human serum just as are normal strains. The trypanocidal substances in human serum are peculiar in that their presence appears to be bound up in the narrowest manner with the functional capacity of the human liver. EHRLICH (1907) was the first to point this out many years ago in his Harben lectures, wherein is a brief remark that in hepatic diseases there is often a small decrease in the trypanocidal action of the serum. This observation led to numerous investigations which have not only afforded an insight into an unknown partial function of the liver, but also have brought out new knowledge on the vital functions of the reticulo-endothelial cell apparatus, the significance of which in curative processes is coming more and more into prominence as observations accumulate [this *Bulletin*, Vol. 19, pp. 154 and 520, and Vol. 20, p. 337 and p. 700].

The author's investigations have shewn that localized lesions of the liver such as tumours do not cause any diminution of the trypanocidal titre of the serum. It is only in those conditions which involve a complete breakdown of the vital functions of the liver resulting from the most severe damage to the whole organ, and in all cases of severe icterus with diffuse hepatitis, that the trypanocidal titre is greatly lowered.

Further work has shewn that the fall in the trypanocidal titre of human serum which takes place in these diffuse parenchymatous disorders of the liver is not a "plus phenomenon" resulting from the formation of new bodies which inhibit the trypanocidal activity, but a "minus phenomenon" resulting from the destruction of the processes which produce the trypanocidal substances. The absence of the trypanocidal substances from the serum of new-born children is due to the fact that the liver has not yet reached its complete functional maturity.

Reference is made to the work of LEICHTENTRITT and ZIELASKOWSKI [*loc. cit.*, Vol. 20, p. 337] who showed that in the acute stage of Barlow's disease of children the trypanocidal action of the serum was diminished, but as convalescence set in it increased. Rosenthal is inclined to ascribe the decrease to a relatively slight destruction of liver function in conjunction with the incomplete functional activity of the liver normally found in sucklings and very young children.

Since human serum is without trypanocidal action *in vitro*, its introduction into the infected animal must call forth some biological mechanism whereby the inactive serum is invested with a new sort of curative action against experimental trypanosome infections. It is known that certain drugs behave in a similar manner, and it is recalled that LAVERAN and MESNIL described the trypanocidal action of serum not as that of an immune body, but as that of a drug.

The work of the author and FREUND [this *Bulletin*, Vol. 20, p. 700] showed that injection of active trypanocidal human serum into animals does not result in the production of antibodies against the trypanocidal substance. Repeated injection of large amounts of human serum does, however, inhibit the protective action of the serum when given therapeutically to the subsequently infected animal, but this is not an immunity process, but an exhaustion phenomenon of the treated organism which is no longer able to form the trypanocidal substances out of the injected serum.

It has been shewn that after extirpation of the spleen and simultaneous iron blocking of the reticulo-endothelium, the trypanocidal action of human serum is very greatly decreased or even totally annihilated ; either of these processes alone frequently produces a definite effect, but the two together constantly produce a marked decrease. Apparently just as the reticulo-endothelium can take up dyes, colloidal suspensions of metals, erythrocytes, bacteria, bile pigments and cholesterin, so contact with the reticulo-endothelium converts the inactive (trypanocidogenous) bodies of human serum into trypanocidal substances. This process illuminates in a particularly characteristic manner the highly important part played by the tissues in curative processes.

A number of somewhat comparable observations are briefly mentioned. It has been shewn that with the rapid fall of the leucocytes, ethylhydrocuprein (optochin) loses its chemotherapeutic activity in experimental pneumococcal infections, and similarly bacteriotrope sera are robbed of the therapeutic property in animals which have lost their leucocytes as the result of action of thorium X. Animals immunized against hen's blood and subjected to X-rays rapidly die after a further injection of hen's blood, because, owing to the severe damage of the mesenchymal vessel wall cells, the poisons set free by the intravital haemolysis can no longer be removed from the circulation by a phagocytic reaction. Mice withstand an otherwise fatal trypsin poisoning when the function of the reticulo-endothelial apparatus is damaged through iron blocking.

W. Y.

COLLIER (W. A.). **Ueber einen Versuch, Tsetsetrypanosomen durch Festigung gegen Menschenserum menschenpathogen zu machen.** [An Attempt to make Trypanosomes Pathogenic to Man by making them fast against Human Serum.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28. No. 11. pp. 484–488. [19 refs.]

The observation of LAVERAN and MESNIL that human serum and that of certain other animals exerted a curative action when injected into small animals infected with certain pathogenic trypanosomes gave rise to many investigations. It was thought that this explained the non-pathogenicity of nagana for man and JACOBY succeeded in making trypanosomes accustomed to human serum and considered that it would be possible to infect men with such trypanosomes. LAVERAN and MESNIL followed up the question and obtained a strain of tsetse trypanosomes resistant to baboon serum and then injected the strain into a young baboon, which remained healthy. The baboon, however, differs from man in that it is resistant to all trypanosomes, and it seemed therefore desirable to examine the question in the case of man, the more especially as such an observation might throw light on the important question of the identity of *T. rhodesiense* and *T. brucei.*

A strain of *T. brucei* (known in the Speyer House as " Strain Prowazek ") was used. This strain is highly pathogenic for mice and very susceptible to human serum. It was rendered fast to human serum and found then to react well to Germanin (Bayer 205). The author injected himself intramuscularly with mouse's blood containing about 200 million trypanosomes. The result was negative. Three other persons were then injected subcutaneously and one intravenously, and in all the result was likewise negative.

From these experiments it follows that tsetse trypanosomes, although completely immunized against human serum, are unable to infect man. The pathogenicity of trypanosomes has therefore nothing to do with the degree of resistance to the serum of the species of animal concerned. LAVERAN and MESNIL were the first to show that human serum has no trypanocidal action *in vitro,* but only when injected into an infected animal. Reference is made to the work of ROSENTHAL and FREUND which indicated that a trypanocidogenous substance in human serum is converted in the injected animal body into an active substance.

The question of the identity of *T. brucei* and *T. rhodesiense* must still be left in abeyance.

[This interesting paper should be read in conjunction with that of ROSENTHAL summarized above.]

W. Y.

KUDICKE (R.), STRAUSS (Ed.) & COLLIER (W. A.). **Versuche zur Gewinnung von trypanoziden Substanzen durch Hydrolyse von Eiweisskörpern.** [Experiments to obtain Trypanocidal Substances through the Hydrolysis of Albuminous Substances.]—*Ztschr. f. Hyg. u. Infektionskr.* 1924. Sept. 20. Vol. 103. No. 3. pp. 622–639. [27 refs.]

The experiments which are the subject of this paper are based on the view that trypanosomes must be influenced by the products of disintegration of proteids. The article is of a somewhat technical nature and should be consulted in the original by those interested. The following are the conclusions :—

1. In the mixture of albumoses and peptones arising from the mild hydrolysis of albuminous substances, substances are present which are able to kill trypanosomes *in vitro*.
2. Possibly products of advanced albuminous disintegration, of which the character is not known, act in a similar manner.
3. The conjecture is probable that similar substances are also formed in the body of the infected animal and aid it in its warfare against the parasites.

W. Y.

LOW (George C.). The Modern Treatment of Human Trypanosomiasis.—*Jl. State Med.* 1924. Nov. Vol. 32. No. 11. pp. 535–538.

MISCELLANEOUS.

SITSEN (A. E.). **Over kwaadaardige gezwellen op Java.** [Malignant Tumours in Java.]—*Nederl. Tijdschr. v. Geneesk.* 1924. May 31. Vol. 68. 1st Half. No. 22. pp. 2467–2478. With 2 figs. [19 refs.]

A description of material from central and east Java collected at the medical school in Surabaya since 1913, consisting of 145 cases (89 carcinoma, 44 sarcoma, 12 of mixed or other nature), 44 among Europeans, 90 among natives and 11 among Chinamen. The usual types of carcinomata and sarcomata met with in Europe were found ; the list is supplemented by the records of other investigators in Java.

Owing to many difficulties, the present knowledge of the incidence of malignant tumours in Java can be based only on hospital returns and results of post-mortem examinations. Hospital returns from Batavia (de LANGEN) show an incidence of malignant tumours of 0·9 per 1,000 (in 48,838 patients) ; in 1,031 post-mortem examinations performed in Surabaya malignant tumours were found in 13 cases (7 carcinomata and 2 sarcomata) ; in Deli (Sumatra) BAERMANN found 12 carcinomata and 2 sarcomata in 1,800 obductions ; on the other hand, SNYDERS found 20 carcinomata in 736 obductions in Medan (Sumatra), quite near to BAERMANN'S hospital. But SNYDER'S material is an artificial coolie population living under favourable hygienic conditions in which, consequently, other causes of death play a less important part (but this applies to BAERMANN'S material also). The incidence in various organs shows the relative preponderance of primary hepatic carcinomata (3 $^0/_{00}$ in Surabaya, 4·5 $^0/_{00}$ among BAERMANN'S, 13 $^0/_{00}$ among SNYDER'S material ; as a comparison : 3 $^0/_{00}$ among the obductions in Amsterdam of persons above 20 years of age (the Javanese material not including younger persons). Carcinomata of the stomach are rare (1 $^0/_{00}$ in Surabaya, 8 $^0/_{00}$ in Amsterdam among persons of the same age) ; so are intestinal carcinomata (1 $^0/_{00}$). Carcinomata of the mouth and the throat (except of the tongue) are not particularly preponderant among natives (7 in 48 carcinomatous tumours) as compared with Europeans in Java (4 in 33 carcinomatous tumours) ; carcinomata of the tongue were much more common among Europeans in Java (5 : 1), although the chewing of Sirih is a widespread habit among natives. External carcinomata were much more prevalent among natives (12: 1).

N. H. Swellengrebel.

MENDELSON (Ralph W.) & ELLIS (Aller G.). **Cancer as a Public Health Problem in Siam.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 15. Vol. 27. No. 20. pp. 274–278. With 6 figs. [2 refs.]

The authors give the cancer statistics for 1922 and 1923 of the Central Hospital, Bangkok.

Number of Persons coming to Clinic.

Male.	Female.	Total.
24,340	3,922	28,262

Cases of Cancer in Males.

	Oral.	Penile.	Gastro-intestinal.	Extremital.	Cranial.
	21	13	4	3	2
Average age ..	50·0	38·1	48·2	52	49·5

Cases of Cancer in Females.

Oral.	Uterine.	Gastro-intestinal.	Mammary.
4	1	1	4

The total oral cases numbered 47·1 per cent. of all cancer cases, and the male penile cases 30·2 per cent. of the male cancer cases. All the patients with oral cancer were addicted to betel nut chewing, which one of the authors considers to be a potent cause (but see ELLIS, this *Bulletin*, Vol. 20, p. 56).

In the Chulalongkorn Hospital, of 102 cases operated on for cancer 52 were of the lip. Of the penile cases they note that circumcision is not practised in Siam, and in a majority of cases a distinct history of preputial irritation can be obtained. [The average age given in the text, 31·1 years, differs from that of the table.]

The incidence of gastro-intestinal cancer is not such as to lend support to the suggestion that the consumption of vegetables contaminated with sewage is a cause, for the use in the East of human excrement as a fertilizer is universal. Superficial cancers are in most cases, if not in all, preceded by luxuriant papillary growth. As evidence of this 8 cases are briefly described, 4 of the lip and 4 of the penis. In the U.S.A. papillary growth precedes cancer of the skin in some cases, but cancer begins usually very soon with rapid infiltration and early ulceration. The glands are implicated early in America, but it is not so in Siam. Unfortunately, the great number of patients come too late for surgical removal. The authors think that the practice of circumcision and the abandonment of the chewing habit would save many lives, but are under no illusions about the difficulty of these reforms.

A. G. B.

OLD (J. E. S.). **Cancer in African Natives.** [Correspondence.]—*Brit. Med. Jl.* 1924. Oct. 11. pp. 689–690.

Dr. Old, writing from Nyasaland, reports having removed from a Bantu man there, twenty years ago, a growth that was microscopically determined (in London) to be an epithelioma. He also reports having seen a quickly fatal sarcoma of the skull in a native boy, an epithelioma of the tongue in a native (Yao) woman, and a growth on the forearm, which possibly was not the sarcoma that he supposed it to be, since in a few months it decreased to half its former size by no other treatment than auto-suggestion —which subtle process he thinks may possibly be the constant exciting *cause* of cancer.

A. Alcock.

HUOT & GONTIER. **Un cas de cancer primitif du foie.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 508–511.

The case of a native of about 35 seen at Dakar with great emaciation and a swollen abdomen. Having drawn off 8-9 litres of fluid the authors felt the liver's edge three fingers below the costal edge in the nipple line; the left lobe, or what corresponded to it, was a mass of woody hardness with rounded bosses. The history went back 4 months. There were signs of syphilis. Death occurred 9 days later. On the lower surface of the liver, which weighed 1882 gms., and on the mesentery, nodules were found of size between a nut and an orange. Histologically there was cirrhosis and decided changes in the liver cells. Primary liver cancer is frequent about Dakar.

A. G. B.

IRVINE (A. C.). **Notes on a Case of Melanotic Sarcoma, with an Account of Two Other Malignant Tumours.**—*Kenya Med. Jl.* 1924. Sept. Vol. 1. No. 6. pp. 183–184.

1. A native woman with two tumours situated symmetrically one on each side of her back, one quite black, the other speckled with black; and also with two large pigmented moles, one on each side of her face, also in symmetry. The larger tumour, which was breaking down, was removed, and was pronounced to be a melanotic spindle-cell sarcoma.

2. A native man with a deep-seated painful growth in the parotid region causing swelling externally and symptoms of "pressure in all directions.' Before the patient went home to die a piece of the tumour that could be removed was pronounced to be a carcinoma.

3. A woman (race not stated) with a myeloma of the lower jaw. The common carotid was tied. A fortnight later five septic teeth were extracted on that side, and a few days later as the temperature rose high and the tumour swelled it was removed, and was found to be gangrenous at centre. The patient died.

A. A.

TANON (L.) & CAMBESSÉDÈS. **L'alastrim.**—*Ann. d'Hyg. Publique, Industrielle et Sociale.* 1924. Sept. New. Ser. No. 9. pp. 552–563. With 2 text figs.

A general account of alastrim which the authors, with the majority of writers, hold to be mild smallpox. They observe that before vaccination was introduced there were mild epidemics of smallpox as well as severe ones, a fact which led to the practice of variolization, but in recent times only severe outbreaks conveyed by non-vaccinated persons have been prevalent, with the result that this form is held to be true variola and the reappearance of the mild form to justify the opinion of a new disease.

A. G. B.

SCHAEFER (H. F.). **Notes sur deux cas d'Alastrim.**—*Rev. d'Hygiène.* 1924. July. Vol. 46. No. 7. pp. 697–699.

A ship put in at a Martinique port October 19–22; an epidemic of alastrim was just over. It then went through the Panama canal, was at Los Angeles, November 6–16, Tacoma, November 20–21, and reached Vancouver, November 22. The first case of alastrim appeared on December 1, and the second on December 15. The author considers Martinique to have been the source of infection of the first case, though the interval was 40 days.

A. G. B.

i. MALONE (R. H.). **A Note on a Series of Cases of Pneumonia treated with Pneumococcus Vaccine.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 105-108.

ii. KING (H. H.). **A Statistical Analysis of Captain Malone's Report on the Treatment of Pneumonia by Vaccine.**—*Ibid.* pp. 109-111.

i. The author has observed that immune bodies were produced more readily in rabbits inoculated with pneumococci obtained directly from the peritoneal cavity of artificially infected rabbits than in others immunized by means of cultures grown on blood agar. The method of preparing the vaccine is described.

The cases at Quetta, comprised 58 of pneumonia, treated alternately with and without vaccine. All received intravenously 10 per cent. glucose in normal saline plus 7·5 grains of quinine hydrochloride once a day, the quinine to combat malaria. The first dose was 400 million of a stock vaccine of Types 1 and 4, and on the next and following day the vaccine was of the homologous type, the type being ascertained by passage of sputum through a young rabbit; 3 doses was the tale. The results are shown in the table:—

	Number of cases.	Number of recoveries.	Average days of fever, recoveries only.
A. Cases treated on or before the 3rd day of disease	18	17	4·4
B. Untreated controls corresponding to group A	17	12	8·3
C. Cases treated on or after the 4th day of disease	11	6	8·7
D. Untreated controls corresponding to group C	12	8	8·8
E. Total cases treated...	29	23	5·5
F. Total cases untreated	29	20	8·5

The effect of the vaccine given before the fourth day of disease has been to shorten the course of illness, lower the death rate and increase the number of cases terminating by crisis rather than by lysis. Moreover, the vaccine treated patients "appeared to be less toxic, slept better and did not have the same respiratory distress as their neighbours." If good results are to be secured, treatment should be commenced before the fourth day.

ii. Major King considers that Captain Malone's results were well controlled, and he endorses Malone's conclusions. He suggests that attempts to grow typed strains in artificial special media containing fresh animal extracts or exudates might be successful in producing antigens as efficient as those produced by the intraperitoneal methods described.

A. G. B.

NICOLAI (A.). **Bijdrage tot de behandeling der croupeuse pneumonie in de tropen.** [Treatment of Lobar Pneumonia in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 901-904.

Lobar pneumonia is one of the principal causes of death in the tropics. The author ascribes the decrease of the mortality from this disease during the last two years in his practice in a coolie hospital in Sumatra to the treatment he administered.

During 1921, 17 of his 39 cases died (43 per cent.). The treatment consisted of quinine injections (0·5 gm. per day) and symptomatical administration of stimulants and sedatives. During the next 2¼ years, apart from the quinine injections, 3 gm. camphor in oil was given subcutaneously every day as long as the fever lasted. In a series of 38 cases there were no deaths. The author did not see that these cases differed in character from those of the previous series, but leaves the possibility open that the decrease of the hookworm infection in his labourers may have favourably influenced their general powers of resistance.

W. J. Bais.

SPRAWSON (C. A.). **Scarlatina in Indians.**—*Indian Med. Gaz.* 1924. July. Vol. 59. No. 7. pp. 344–345.

The author recalls that ROGERS, in his "Fevers in the Tropics," states that when scarlatina is imported into India it rapidly dies out, and that it rarely, if ever, attacks natives of the country. The author is inclined to question this conclusion. "When," he writes, "an infective disease does not occur in a country, it is probable either that the organism has not been introduced into the country, that its vector is absent, that the adult population has acquired immunity, or that the conditions for the organism are unfavourable." Scarlatina has often been introduced and a small epidemic at Lucknow in 1914 showed that the conditions are not always unfavourable. He thinks that the disease probably does occur among Indians because: (*a*) Acute nephritis is a common disease among young Indians, who often give a history of "fever," and nephritis in the young is commonly due to an "infection"; (*b*) He has seen two Indian children of a family desquamating after a fever and a third with signs of nephritis. There is therefore in the United Provinces an acute febrile disease followed at times by nephritis. He explains why this disease has not been recognized and concludes with the practical suggestion that a number of nephritic Indian children and controls should be tested with the rival claimants for recognition as the cause of scarlatina, viz., the anaerobic diplococcus of DI CRISTINA and the haemolytic streptococcus of DICK, by complement deviation or skin test.

A. G. B.

YANG TING KUANG & SHIH (W. H.). **Scarlet Fever in China.**—*Nat. Med. Jl. China.* 1924. June. Vol. 10. No. 3. pp. 153–170; and *North Manchurian Plague Prevention Service. Reports 1923–1924.* Vol. 4. pp. 207–233.

As scarlet fever is a disease of temperate climates and China, Manchuria included, lies between 20° and 54° N., great variations may be expected in its incidence. A questionnaire was therefore sent to doctors in various parts of the country, and here we have the replies collated, and supplemented by available medical publications. In LENNOX'S statistics of the health of foreign missionary families in China there were 193 cases of scarlatina among the children, 104 in North China (12·5 per cent. deaths), 85 in Central China (2·3 per cent. deaths), and 4 in South China (no deaths). There follow details for Hong Kong and ten Provinces. In Hong Kong during 12 years (1911–22) out of 15,493 cases of infectious disease only 41 were scarlet fever, and

10 of these were in Europeans. An interesting extract is given from Dr. Arthur STANLEY's report for 1917 on Shanghai. The disease was first recorded there in 1873, and in 1902 there were said to be 1,500 Chinese deaths. It is of virulent type among both Chinese and Europeans. It is at its maximum in spring and at its minimum in autumn, a seasonal prevalence which is probably due to the hot summer. Of 638 cases seen at the Peking Government Infectious Diseases Hospital in 1915–23, 20·8 per cent. died. The disease is much feared by the well-to-do. Among the authors' conclusions are the following :—

" 1. Scarlatina is practically absent or very mild in South China, not unduly severe in Shanghai and central provinces, and severe in the north.

" 2. The disease seems to be comparatively more frequent among Westerners residing in the country. In the north, although several deaths have been recorded among them, infection is usually not so severe as among the same classes of Chinese. The statistics on missionary families, compiled by Dr. Lennox and briefly referred to elsewhere in this article, form instructive reading.

" 3. The special virulence of the disease manifested when Chinese are attacked in epidemic form may be explained partly by its recent introduction into the country before any natural immunity is yet evolved. But the example of Japan, which, owing to her complete hospitals, and thorough system of notification and isolation, has only allowed a mild and infrequent form to appear among the people, is sufficient to teach the responsible authorities in China the best and quickest way of subduing the disease. '

A. G. B.

BASU (Uma Prasanna). **Fifteen Cases of Exanthematic Typhus in Calcutta.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 396–401. With 4 charts and 2 figs. [6 refs.]

Between November, 1922, and January, 1923, the author saw 15 cases of fever in Calcutta diagnosed as typhus owing to : (1) the early appearance of nervous symptoms—headache, delirium, vomiting and prostration ; (2) the appearance on the 4th or 5th day of a macular exanthem which became petechial ; (3) its persistence ; (4) the continuation of fever to the 12th or 14th day. Twelve cases were in children aged 11 months to 12 years, 3 in adults. None died. In 3 cases lice were discovered on the hair of the scalp and the eyelashes. Six cases occurred in one house, and owing to the coldness of the season the children's underclothes were never taken off, so that the conditions were favourable to body lice, though it seems that none were found. Measles was ruled out by the absence of oculo-nasal catarrh, of the horse-shoe shaped rash in the circumoral region, and of Koplik's spots. The Weil-Felix test was carried out 3 times, by Major ACTON and his assistant, in 2 cases 2–3 weeks after the fall of temperature, when the reaction was positive, 1 in 30, and in the other on the 5th day when there was no agglutination. The author notes that an endemic area of typhus has been recorded in the north-east of the Punjab and the Himalayan hill tracts. Three temperature charts are given and a photograph showing the petechial rash one month after convalescence. [Curiously, the author does not refer to PHIPSON's paper (this *Bulletin*, Vol. 21, p. 472) on typhus in Simla. Here the rash was by no means obvious and might have been overlooked, but the Weil-Felix reaction was positive in 10 cases. 1 : 32 was considered to be positive and 1 : 100 was exceeded in 7 cases.]

A. G. B.

CUNNINGHAM (J.) & THEODORE (J. H.). **Typhus Fever in the Agency Tracts, Madras Presidency.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. p. 506. With 1 fig.

The distribution of typhus fever in India being so imperfectly known, this paper is intended to record the occurrence of nine cases of the disease in the Agency Tracts of the Madras Presidency in Feb.-March, 1924, the Weil-Felix reaction being confirmatory in the case of one serum sent to the King Institute for examination. The cases occurred among the Assam Rifles, who had arrived in the Agency at the end of January. So far no case has been reported among the civilian population of the Tracts, where the disease was previously unknown.

A. A.

STUART (George). **Observations on the Incidence of Typhus Fever in Palestine with Special Reference to Type and Diagnosis.**—*Jl. Roy. Army Med. Corps.* 1924. Oct. Vol. 43. No. 4. pp. 271–281. With 1 map in text. [12 refs.]

The point of this paper lies mainly in the last words of the title. During the 3¼ years, January, 1921, to March, 1924, there were recorded in Palestine, mainly among Jews in Jaffa, 137 cases of typhus fever of a lenity so remarkably constant that 112 of them could be described as "mild clinical typhus" without delirium or loss of consciousness, and 18 more being unaccompanied by any rash could be set down as "atypical."

Whether these cases are evidence of a smouldering residue from the epidemic that raged in Palestine between 1915 and 1917, or whether the infection was introduced *de novo* with the flood of Jews (31,551 since September, 1920) that came into Palestine (mainly through Jaffa) from the lately typhus-stricken regions of Middle Europe, is left an open question. What the author emphasizes is the extraordinary consistency with which the Weil-Felix reaction was justified as a means of diagnosis.. Of 102 of the clinically positive cases put to this test—many of them by FELIX himself—only 1 was negative; moreover, the reaction was positive in all of the 18 atypical cases. Initial failures of the reaction can be overcome by repeating at intervals between the 3rd and 12th days of the disease.

A. A.

FORSYTH (W. L.). **Infantile Billiary Cirrhosis of the Liver in India—a Review.**—*Trans. S. Indian Branch Brit. Med. Assoc.* Madras. 1924. Vol. 17. No. 2. pp. 85–99.

This effective paper does not make any essentially important addition to the recorded facts, but gives a novel (biochemical) version of their interpretation.

The historical review reminds us that infantile billiary cirrhosis is an insidious, painless, fatal enlargement of the liver, not connected with any specific dyscrasia like syphilis, malaria, etc., occurring in quite young children chiefly of the Hindu community, in all parts of India. The disease was first noticed in Calcutta, originally by SEN, and thereafter by GIBBONS, who gave it its name, described it as essentially a primary fibrosis of the hepatic tissue accompanied by proliferation of the bile-ducts, and believed it to be caused by chemical irritants derived from ill-digested food.

The author has studied the disease in the Madras Presidency, where, in certain districts, its incidence is particular to children of the Brahmin caste—a well-to-do class whose diet, strictly vegetarian, is vitiated by an intolerable deal of chilli, pepper and other curry-spices and hot condiments. He therefore inclines to the irritant theory of causation and thinks that the irritant may reach the infant in the mother's milk, or possibly also, to begin with, during intra-uterine existence. He has done various feeding experiments with rabbits, and finds that an atrophic cirrhosis of the liver followed the feeding of a rabbit on a normal diet with addition of curry-stuff; and he refers also to FINLAY's experiments in the production of biliary cirrhosis in rabbits by subcutaneous injection of manganous chloride. His investigations of the milk of nursing women are still in progress. So far he has but an impression that the milk of the Brahmin mother is richer in fat than that of other castes. (However, the liver of a rabbit fed on a normal diet *plus* excess of fat showed nothing of interest.) Various other theories of causation are considered; those that, in the author's opinion, may have some contributory significance are vitamin deficiency and errors of diet (as distinct from a specifically vitiated diet); both of these might reasonably be supposed to operate through the milk, the character of which is well known to be influenced by the maternal food and environment.

Both from the historical and the descriptive standpoints the paper is very useful, quite apart from the theory of causation, which is of the nature of a preliminary communication.

A. A.

GOMES (J. M.) & DE ASSUMPÇÃO (Lucas). **Em torno do genero coccidioides.**—*Ann. Paulist. Med. e Cirurg.* 1924. Vol. 15. No. 3. 13 pp. With 8 figs. [18 refs.]

Coccidioides immitis is responsible for a disease which is often erroneously described under the name of Blastomycosis. If the skin only is affected the condition yields to treatment, but if the mucous membrane and lymphatics are involved the disease is very serious and often fatal. *C. immitis* has been held to be the only species known, but the author furnishes evidence to controvert this. He describes two types which differed in several particulars. Type A. was obtained by puncture of an abscess of the neck in a patient with severe generalized infection. The disease terminated fatally after a course of a few months. Type B. was from a patient who had suffered for three years and showed lesions of the face, neck and chest. Cultivation on Sabouraud's glucose medium did not give a growth for over 2 months. The patient's local condition improved greatly with administration of iodide of potassium and the glands cicatrized, but death occurred later from acute tuberculosis.

H. Harold Scott.

POLECK. **Ueber die eigentlichen Ursachen und ueber das Wesen der sogenannten Tropenneurasthenie.** [The Essential Causes and Nature of So-called Tropical Neurasthenia.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. May. Vol. 28. No. 5. pp. 193–205. [7 refs.]

The author's experience was gained in South-West Africa, where he took part in the Hottentot War, 1904–7. He does not admit that tropical neurasthenia should be regarded as a special disease condition. Climate has nothing to do with it. Tropical neurasthenia can be spoken of only in the sense in which we speak of war neurasthenia and the like.

A. G. B.

BIRT (Ed.). **Zur Behandlung der Elephantiasis Arabum des Unterschenkels.** [Treatment of Elephantiasis of the Leg.]—*Deut. Ztschr. f. Chirurg.* 1924. Mar. Vol. 184. No. 1–2. pp. 110–114.

An account of two Chinese cooks on whom the author operated at Shanghai for elephantiasis of the leg. No mention is made of filaria. The author seems to attribute the disease to a pathogenic agent living in the Yangtse water in which the patients were accustomed to wade. The operation was a modification of Sampson HANDLEY's in which a long strip of thickened skin was excised and silk threads were laid in and removed after 3–4 weeks.

A. G. B.

BURNET (Et.) & CONSEIL (E.). **Quelques expériences sur la neurovaccine.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 165–181. [4 refs.]

LEVADITI and NICOLAU (see this *Bulletin*, Vol. 19, p. 618, under MUTERMILCH) in their experimental studies of the ectodermoses, or ultra-microscopic infections of tissues derived from the epiblast, have considered the natural affinites of neurovaccine, and again (*Bulletin*, Vol. 20, p. 7, p. 680, and p. 847) have discussed its preparation, selective affinities, and possible practical applications. JANCOU also (Vol. 20, p. 847) has recorded the results of its practical use for vaccination. The present authors describe further experiments with neurovaccine, from which they conclude that although by its purity it is an ideal material for the experimental study of vaccinia, yet for human vaccination it has no decided advantages and may sometimes provoke a too intense reaction.

A. A.

LUIS NICOLINI (Héctor José). **Sobre anquilostomiasis y lepra.**—*An. del Depart. Nac. Hig.* Buenos Aires. 1923. Mar.-Dec. Vol. 29. No. 2. pp. 102-105.

In Corrientes the percentage of infection with hookworm in the rural districts is about 70; in the northern districts, such as Bella Vista, San Luis, Empredado and others, it is higher still.

There are 253 lepers in the same Province, one per mille; in 1906 the incidence was 0·76 and in 1916 it was 0·97 per mille. Measures recommended for dealing with leprosy are on the usual lines of compulsory notification and segregation in leper-colonies, each Province providing its own at the expense of the Government. The author is opposed to isolation or segregation on an island because the measure appears to partake too greatly of the nature of imprisonment.

H. Harold Scott.

MUKERJI (Girindra Nath). **Symptoms and Treatment of Lathyrism.**—*Indian Med. Rec.* 1924. Sept. Vol. 44. No. 9. pp. 265–271. [some 90 refs.]

The author gives a full account of the symptoms, diagnosis and prognosis of lathyrism with remarks on its pathology and treatment and lathyrism in animals. He discusses the prophylaxis, summed up in the restriction of the use of the grain, and has collected a long list of books and papers bearing on the subject. A. G. B.

REDAELLI (Piero). **Experimental Moniliasis.**—*Jl. Trop. Med. & Hyg.* 1924. Aug. 1. Vol. 27. No. 15. pp. 211–213. [6 refs.]

The author has inoculated by various routes rabbits, guineapigs, rats and dogs with five species of Monilia described by CASTELLANI, one of which was isolated by the author at Pavia. He describes the reactions produced. Two species were lethal to all the animals except the dogs, and one was not pathogenic to any experimental animal. A. G. B.

BURKITT (R. W.). **Monilia Infection of the Larynx and Trachea.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 145–146.

The author has seen at least five cases of Monilia infection of the larynx and trachea causing acute obstruction and necessitating tracheotomy. Four were in children and one in an adult; four were Europeans. All had very high fever and nothing abnormal was visible in the pharnyx. After relief from the obstruction, which comes on very quickly, they soon recover; the poison does not seem to affect the heart. In one case he got a complete cast of the trachea and division into bronchi; in the others the membrane came away in bits. Monilia was clearly demonstrated in the cast specimen. Other doctors in Kenya have had similar cases and the author recommends the carrying of a tracheotomy tube and suitable knife. Two cases of this kind are referred to in the Report of the Bacteriological Laboratory for 1921, under the heading pseudo-diphtheria.

[In the November number of the same journal is an account of one certain and several probable cases of diphtheria in Nairobi causing laryngeal obstruction, so that it would appear that caution is necessary in diagnosing moniliasis.] A. G. B.

MAXWELL (James L.). **Chronic Intussusception.** [Correspondence.]—*Brit Med. Jl.* 1924. Aug. 16. p. 299.

The writer says that in Formosa, where he worked for about 20 years, chronic intussusception formed one of the commonest of serious intra-abdominal surgical conditions; he himself has operated on close on 40. The most characteristic symptom was paroxysmal pain, with complete or almost complete remissions between the attacks. His practice was to reduce the intussusception as far as possible, without the use of unreasonable force, and then to do an ileo-colic anastomosis around the remaining intussuscepted portion. Several such cases were observed for years and remained well. In most instances there appeared to be a tuberculous mass in the caecum and several cases had diffuse miliary tubercles over the surrounding intestines. A. G. B.

BENSTED (H. J.). **Three Cases of Multiple Abscesses of the Liver.**—*Jl. Roy. Army Med. Corps.* 1924. Sept. Vol. 43. No. 3. pp. 208–210. With 1 text fig.

According to ROGERS hepatic abscess due to *B. coli* has been rarely described. The three cases here recorded appear to have occurred in India. In each case, 8, 8 and 12 hours after death, pure cultures of *B. coli* were obtained from the pus.

A. G. B.

ROSKOTT (E. R. A. Luyke). **Stollingstijd en aantal bloedplaatjes bij Mijnworm- en Malaria-anaemieën.** [Coagulation Time and Number of Blood Platelets in Hookworm and Malarial Anaemia.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 581–587. [7 refs.]

In five normal individuals in the tropics the coagulation time (DUKE'S method) varied from 8–19 minutes, the number of platelets from 180,000–460,000 (average 250,000). No marked relation was found between the coagulation time and the number of blood platelets; neither was such a relation detected in anaemia cases. The coagulation time in these cases was not markedly increased. Thrombocytopenia (under 200,000) existed as a rule in malarial patients with enlargement of the spleen. The number was normal in hookworm anaemia.

W. J. Bais.

GROOTINGS (J. W.). **Over Amyloidosis bij Javanen.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 592–599. With 3 coloured plates. [12 refs.]

Grootings gives an anatomo-pathological description of two cases of this affection which is rare in Javanese (this *Bulletin*, Vol. 20, p. 673). In his cases, one apparently caused by chronic malaria, the other by chronic Bright's disease, the distribution of the degeneration over the various organs did not differ from the usual findings in Europe.

W. J. Bais.

MANN (W. L.). **Further Remarks upon an Edema Disease in Haiti, with Special Reference to Etiology and Epidemiology.**—*Milit. Surgeon.* 1924. Sept. Vol. 55. No. 3. pp. 297–328. With 16 figs. [9 refs.]

An account of oedema disease in Haiti was published by the author and two colleagues in 1920 (see this *Bulletin*, Vol. 17, p. 249). The conclusion then reached was that the diet was not at fault. The continued investigations and later conclusions are contained in the present paper, which should be in the hands of all medical officers in the tropics who have to deal with beriberi-like conditions in institutions. The upshot is that the etiology is by no means simple. Diet plays an important part—the ration, its cooking and its serving, but other causes operate such as lack of exercise, and deprivation of sunlight, and possibly others not yet recognized. The problem was that prisoners in certain jails in Haiti were dying, at ten times the normal rate, of a disease of which oedema was the general manifestation, but symptoms might be pulmonary or intestinal, or the oedema replaced by emaciation, so that diagnosis was doubtful, and for some time it was uncertain whether the disease was one or not. Other prisons were quite free. In the first 12 months the money value of the prison ration was increased 50 per cent. and the sanitary conditions improved, but the fatalities continued.

Epidemiology.—The women prisoners were almost exempt. Of 142 consecutive deaths in the Civil Prison, Cape Haiti, only two were of women prisoners, and those from other causes, but women seem to have been few, about one to fifteen in the prisons taken together. The incidence was epidemic, the disease would appear suddenly, many deaths occurring and would often disappear as quickly. Prisoners confined longer than one year were practically exempt; 62 per cent. of the deaths occurred in persons who had been incarcerated not more than three months. The table shows the tendency to attack certain classes of prisoners.

Class of Prisoners (Penitencier Nacionale).	*Incidence per cent.*
Women prisoners (except women insane)... ...	0
Women insane prisoners	30
Men prisoners (confined over 1 year)	1
Men prisoners (confined less than half a year) ...	80

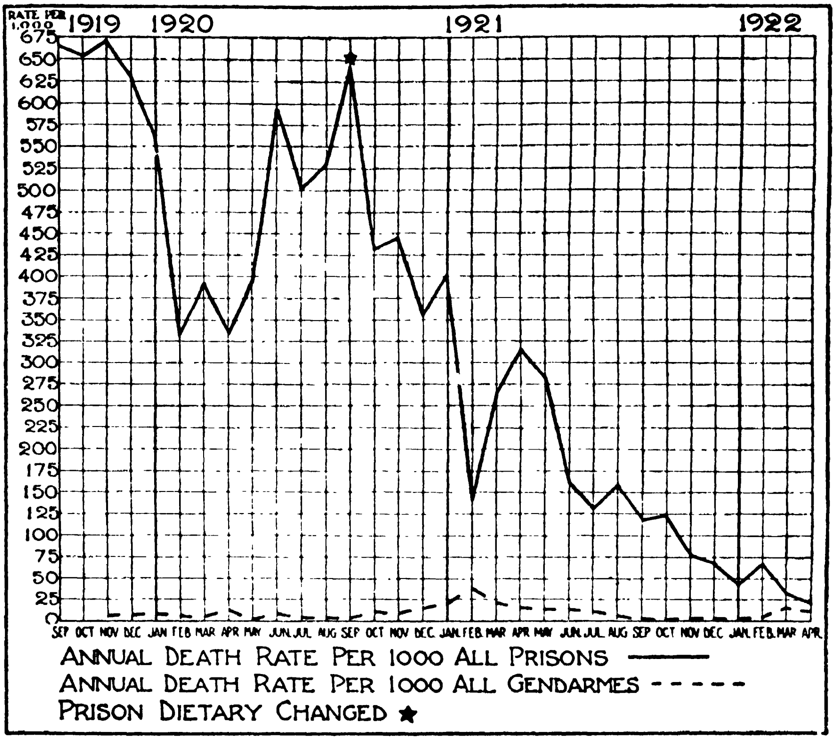
The following extract shows the difficulties of the investigators:—

> "In one prison, for a period of six months there was a *monthly* mortality rate of 5 to 10 per cent. from this disease, whereas in another institution in the same place and under supervision of the same medical officer, no cases of this disease developed during this period. The money value of the ration of the two institutions was the same, and the dietary was apparently so similar as to be considered practically identical by a casual observer."

Of 44 bandits captured and confined in cells for eight weeks awaiting trial, 4 died within 4 weeks, 25 per cent. had symptoms in 7 weeks and a year later 35 had died in prison. But no evidence of the disease was found in nearly a thousand bandits captured two weeks after the others, so that prison conditions must have been primarily responsible. Another illuminating observation is that amongst the gendarmerie, who about equalled the prisoners in number, were quartered in some instances in the prisons and given an almost identical ration, no case was noted in six years, though in 12 months 1,000 prisoners died. But "there were ten cases in ex-gendarmes who had later assumed the status of prisoners."

Etiology.—Infection was at first suspected and attempts were made to transmit the disease by bedbugs, but the supposition was abandoned. In September, 1920, instructions were issued that the quantity of green leafy vegetables in the diet should be increased and the loss of the germ and pericarp avoided by discontinuance of the practice of sifting or fanning the corn-meal. From this time the mortality and morbidity "presented a gradual, progressive and sustained decrease," as is shown in the attached chart. The author, however, does not consider faulty diet to be the sole or controlling cause. Other factors are necessary to explain the incidence on different prisons and among groups of inmates of a single prison.

Such possible factors are: (1) "inequality of distribution of vitamins to the individual rations." The corn-meal was boiled with lard in a twelve-gallon container; after boiling "for several hours" it became almost solid. It is suggested that the germ and pericarp, as well as the fat soluble A extracted by the lard, tend to collect at the upper layer and there remain. The female prisoners who were free had their food issued first; the insane females were not fed with the others. After the women had been supplied, food was served to the long-timers and tradesmen, who very seldom developed oedema, and last of all to the short-timers and recent arrivals, among whom the disease was most prevalent. Later, the order of serving at Cape Haiti was varied, and it is stated that then the disease appeared among the women. Experiments with rats gave some support to this hypothesis.



Annual death rates, per thousand, by months, for all prisons of Haiti, with corresponding rates for the gendarmerie, inserted for comparison.

Chart illustrates the progressive decrease in prison death rate following specific changes in prison dietary, *i.e.*, an increased supply of vitamin-containing food. The slight increase in early part of 1921 was caused by deaths from smallpox.

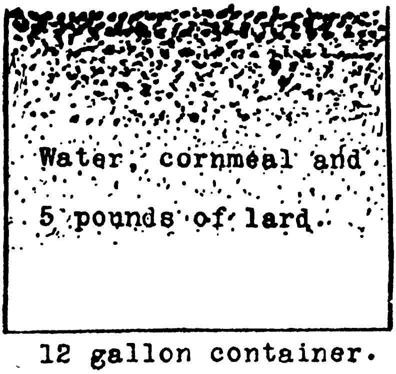
[Reproduced from the *Military Surgeon.*]

(2) Deprivation of sunlight. The oedema disease in Haiti is confined primarily to institutions, many of the inmates of which have not free access to sunlight. Here it is significant that prisoners in Haiti awaiting the quarterly assizes cannot be required to perform any labour and hence their access to sunlight is restricted. Four long-term prisoners were given solitary confinement; three developed severe symptoms of oedema and two died. Here again the partial absence of sunlight may have been the factor which produced the disease. Here is an interesting extract:—

" In one of the smaller prisons where the disease was most prevalent and the death rate extremely high, the prisoners were removed from the main prison which was undergoing repairs, and k ree weeks in a temporary building without a roof. Shortly aft lema rapidly disappeared from the inmates, and no deaths oc ix months.

"During the prisoners' sojourn in the temp ng, we had completely disinfected and disinfested the main p he beneficial results were originally attributed to the success of our efforts in ridding the place of an infective agent, but it is not improbable that sunlight was the responsible agent in temporarily stamping out this disease. Changes in diet were made shortly afterwards."

(3) Lack of exercise. **Blacklock** has recently affirmed this as an explanation of beriberi in prison tailors at Freetown [see page 100]. The authors found that prisoners employed at minor tasks showed less tendency to develop oedema than those who were not required to work. Patients with oedema improved more rapidly if given minor tasks than others whether put to bed or left merely unemployed. The effects, however, of severe muscular exercise, as marching, were disastrous. It is admitted that (2) and (3) are not easily disentangled.



←Vitamin layer.—Served to women prisoners (except insane women); oedema distinctly absent.

←Intermediate layer. — Served to tradesmen and long-timers, oedema rare.

←Avitamin layer.—Served to short-timers; oedema very prevalent.

Schematic Representation of the Method of Cooking and Serving Cornmeal in the Penitentiary in Haiti.

There is a possibility of a concentration of vitamins in upper layer of the cooking mass, thereby causing an unequal distribution of vitamins in the individual ration when issued to the prisoners.

It is suggested that fat-soluble vitamin "A" (due to extraction by means of the lard) and water-soluble vitamin "B" (due to lighter specific gravity of the germ and pericarp which is the vitamin-containing portion of the grain and due to evaporation of water) tend to collect at the top of the container, thus leaving a vitamin residue in the uppermost layer.

Also due to the eventual viscosity of the cornmeal mixture, the lower portion of the mixture is apt to attain a higher degree of temperature—as it is closer to the heat—and thus this will have a greater tendency to destroy the vitamins present in the lower portion.

[Reproduced from the *Military Surgeon.*]

Symptoms.—Hypertrophic, atrophic, mixed and acute pernicious forms are described. The cardinal symptoms are oedema, extreme emaciation, slow pulse rate, subnormal temperature and muscular atrophy. "The absence of partial paralysis, tachycardia and cardiac hypertrophy should serve to differentiate the condition from the disease entity described as beriberi," but the relation of these diseases depends on the definition of beriberi. An instructive table of the symptoms of beriberi and oedema disease is given, and it is suggested that the substitution of corn-meal for rice may account for the differences.

A. G. B.

SARKAR (Sarasi Lal) & BANERJI (Santosh Kumar). **Epidemic Dropsy at Atrasia Village.**—*Calcutta Med. Jl.* 1924. May. Vol. 18. No. 11. pp. 731–737. [6 refs.]

An account of a small outbreak affecting the inmates of three houses.

A. G. B.

MACKIE (A. S.). **Myositis Purulenta Tropica.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. p. 137.

Case of a Somali in whom four deep-seated abscesses were opened in back, buttocks and thigh, giving vent to much pus. The disease is said to be common, to run a prolonged course, and to be accompanied by much debility.

A. G. B.

GULLAND (G. Lovell). **A Note on Psittacosis. With Reports of Two Related Cases.**—*Brit. Med. Jl.* 1924. Aug. 23. pp. 308–309. [3 refs.]

The infection in birds is generally supposed to be contracted from the excreta, which frequently may contain the specific organism, *B. psittacosis.* Two sisters who alone attended a newly arrived Africa parrot were affected. The parrot had diarrhoea and died the day before the onset of the first case, in which the symptoms were those of an atypical pneumonia, as is sometimes seen in paratyphoid fever. This patient died on the fifteenth day, and the second made a slow convalescence. No diagnostic bacteriological or serological observations are reported, but in the second case the pleural fluid was sterile. Such cases may be more common than is generally believed and recognition is difficult.

P. W. Bassett-Smith.

NÉEL. **Côte française des Somalis. Considérations générales concernant la morbidité et la mortalité au cours de l'année 1923.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan. Feb. Mar. Apr. Vol. 22. No. 1. pp. 81–89. [1 ref.]

Nothing has been published of late years about the diseases met with in French Somaliland. According to the author, the heat is not excessive, the maximum only rarely exceeding 42° (107·5° F. !), but the air is always saturated, and, to increase the discomfort, in the summer months there is no breeze, and hardly any fall of temperature at night.

Europeans.—These number 400 to 500, many of whom are old residents. Amoebic dysentery is almost the only tropical disease met with, and this in a mild form. Malaria occurs rarely at Djibouti, and blackwater fever has not been seen. Asthenia and anaemia are common in summer, respiratory affections unexpectedly so in winter. Heat stroke, which one would expect to be a menace, is not so, except in stokers and persons similarly employed.' One case at least of typhoid was contracted locally. Lichen tropicus and furunculosis are widespread. The boils are treated, always with success, with sulphate of copper in 0·5 per cent. solution, 5 to 10 cc. injected daily into a vein for 8, 10 or 15 days; the injection, which must be given slowly, is painless. Venereal affections are rare. Children stand the climate badly unless the mother can take them to Abyssinia in the hot weather.

Diré-Daoua, on the Addis-Abbaba railway, has a good climate, but is plagued with malaria ; Harrar, to the south, at 1,800 metres altitude, is a very suitable sanatorium, but access is difficult.

Natives.—Djibouti is the only town with a medical service. The natives, who are either Somalis or Dankalis, in their reaction to disease resemble whites rather than negroes. Smallpox has disappeared, probably owing to thorough vaccination. Typhus has never been recognized, but occurs at Harrar. Tuberculosis is widespread and attacks equally the lungs, bones and glands. The pulmonary form develops as in Europeans but somewhat more rapidly, probably owing to the climate and the underfeeding, for most of the natives subsist chiefly on the milk of badly nourished goats ; syphilis is a frequent concomitant. The local natives are shepherds, sleeping in tents and spending the whole day in the sun, but this does not save them. Hygiene is lacking ; they eat from a common plate, pass the pipe from mouth to mouth, and custom decrees that they receive in their hands the sputa of the sick relative or friend.

Syphilis and gonorrhoea are common and cases of lymphogranulomatosis [? climatic bubo] are seen. Trachoma is widely spread. There is no leprosy and no beriberi except in the prisons. In October a form of dengue known as *abourakab* rages ; there are no phlebotomi. Two cases of sprue have been seen, one in a Frenchman who before his arrival at Djibouti had never quitted France. Bilharziasis and yaws are absent. Tropical ulcer is the disease seen most frequently at the dispensary. Mycetoma with both black and yellow grains is not rare. A case is briefly recorded of a supposed lipoma removed from the dorsum of the foot, which on section was found to be stuffed with the black grains of mycetoma ; two years later there was no relapse.

A. G. B.

ACTON (H. W.). **Some Recent Advances in the Diagnosis and Treatment of the Commoner Tropical Diseases.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 37–42.

Most of the points of this interesting paper have been already noticed in their appropriate places. Some will bear repetition. All the advances described have been made at the Calcutta School of Tropical Medicine.

Ancylostomiasis.—The relative value of chenopodium and carbon tetrachloride is considered ; for coolies chenopodium is advised if it is important to keep the men at work, CCl_4 if the loss of two days is immaterial. It has been shown that the female hookworm lays more eggs in the three months July-September, and that in these months, which are also those of maximum infection, many young larvae are in the tissues on their way to the gut. Mass treatment is therefore valueless during and immediately after the rains, and only urgent cases should be treated at that period.

Kala azar.—The author considers the results obtained with Von Heyden's 471 to be vastly superior to those of antimony tartrate [Vol. 21, p. 255].

Leprosy.—In India the initial lesions occur usually on the surface of the body, owing to abrasions ; in Europe the nose is the more common site, owing to the protection of clothing and the fact that people do not lie on the ground. When the bacilli are confined to the skin the disease is non-infectious, and the subjects need not be isolated. Diagnosis depends on: (1) superficial anaesthesia, tested by touching the surface lightly with a piece of rolled paper; (2) implication (thickening) of nerves supplying the area; (3) the finding of lepra bacilli in nodules in the ear and face. Fifteen per cent. of out-patients attending the skin department are suffering from leprosy. By treatment 90 per cent. can be rid of all signs of the disease.

Amoebic dysentery.—Deeks' treatment is adopted because the bismuth alters the reaction of the stool in the direction of alkalinity.

Malaria.—Quinidine is the most powerful of the cinchona alkaloids, but owing to numerous objections to it cinchona febrifuge is used at the School of Tropical Medicine; it is cheap, does not produce nausea, and when given two hours after a meal "the alkaloids arrive in the intestine at the height of alkalinity."

> "If this method was generally adopted there would be an enormous advantage, both in the manufacture, as these total alkaloids can be extracted easily, and in the planting of cinchona, as the trees could then be cultivated in places over 3,000 feet high, whereas *Ledgeriana*, the cinchona that gives the best quinine yield, will only grow in volcanic regions with a supply of rain such as occurs in Java and at Mungpoo. The use of cinchona febrifuge would therefore be an advantage, as this would simplify the manufacture and bring a larger area under cultivation so that India could supply the necessary amount of cinchona alkaloids for her needs."

The author finds that when quinine is in an alkaline substrate three times the amount is absorbed; the febrifuge is therefore given with citric acid, converted in the bowel to carbonate [*l.c.* p. 602].

A. G. B.

CHUN (J. W. H.). **Remarks on the Incidence of Certain Diseases in Chinese and Europeans.**—*Nat. Med. Jl. China.* 1924. June. Vol. 10. No. 3. pp. 145-152. [5 refs.]; and *North Manchurian Plague Prevention Service. Reports 1923–1924.* Vol. 4. pp. 199–204.

Fistula in ano is common in China; 16 per cent. of 455 operations done by LIBBEY in Wuhu were for this condition. *Tuberculosis* is widespread. Of 1,705 cases seen in 10 months at Harbin, 748 were of glands, 312 of skin, 257 of bones, and 196 of lungs. As the Chinese do not drink milk, the source must be human. *Malignant scarlet fever* was introduced in 1873, and is now of a virulent type. Many Chinese children die of it in the treaty ports. Attacks in foreigners are severe whereas the mortality in Europe is about 3 per cent. *Syphilitic rheumatism.*—Of 689 cases of syphilis seen 71 per cent. were secondary. Many of these complained of rheumatism. No case of tabes or G.P.I. was seen in 4 years.

Appendicitis.—Two cases were admitted in 4 years. In the Harvard Medical School Reports there were

20 European cases in 240 admissions=8·3 per cent.
10 Chinese „ „ 766 „ =1·3 „ „

Carcinoma is not so rare in China as is believed, but "it can be assumed that it is rare when compared to European figures."

Chloroform is taken better by the Chinese than the European; at Canton ten thousand patients were anaesthetized without a death.

Two tables give data from eight sources showing the relative frequency of a number of diseases among the Chinese.

A. G. B.

BOBBERT (A. C.) & VAN DAM (S.). **Graphische Voorstellingen van de voornaamste ziekten betreffende het Nederlandsch-Indische Leger gedurende de jaren 1908 tot en met 1923, bewerkt naar gegevens van het Hoofdkantoor van den Militair Geneeskundigen Dienst.** [Graphic Representation of the Most Important Diseases in the Dutch East Indian Army from 1908–1923, composed from Data supplied by the Head Office of the Military Medical Service.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 728–729. With 18 charts.

Eighteen graphs concerning enteric, malaria, influenza, cholera, dysentery, bacillary dysentery, amoebic dysentery, beriberi, tuberculosis, primary syphilis, later stages of syphilis, soft chancre, gonorrhoea and its complications, trachoma, pneumonia, abscess of the liver, yaws and sprue, preceded by a few introductory remarks.

W. J. Bais.

SISON (A. G.) & SISON (A. B. M.). [In English & Spanish.] **Study of Anatomico-Clinical Diagnoses based on 2,282 Autopsy and Clinical Records of Medical Cases. Estudio de diagnosticos anatomico-clinicos basados en 2282 autopsias y hojas clinicas en la clinica medica.**—*Jl. Philippine Islands Med. Assoc.* 1924. July. Vol. 4. No. 7. In English pp. 251–256. [3 refs.] In Spanish pp. 276–278.

From ten years' (1911–1922) records of more than ten thousand autopsies furnished by the pathology departments of the Medical College of the Philippines University and of the Philippines General Hospital the authors have selected only the medical cases, which number 2,282. The clinical diagnoses made from these cases were 2,412 in number, and the "anatomical" diagnoses 3,046. It would appear that the clinical diagnosis was found to correspond with the anatomical diagnosis in 58 per cent. of cases. Excluding an unspecified number of pathological conditions not defined in accordance with the official nomenclature, the numerical list of diseases is as follows :—

Typhoid fever	213	Amoebic dysentery ...	63
Broncho-pneumonia ...	412	Acute nephritis	267
Lobar pneumonia ...	178	Chronic interstitial nephritis	211
Acute miliary tuberculosis	101	Chronic parenchymatous nephritis	134
Pulmonary tuberculosis ...	238	Adult beriberi	36
Epidemic encephalitis ...	4	Infantile beriberi ...	34
Cerebrospinal meningitis	96	Malaria	57
Tuberculous meningitis ...	72	Chronic myocarditis ...	34
Chronic endocarditis ...	165	Cerebral haemorrhage ...	97
Acute endocarditis ...	30	Portal cirrhosis	76
Arteriosclerosis	127		
Ileocolitis	228		
Bacillary dysentery ...	74		

A. A.

HOPKINS (F. Gowland). **Huxley Memorial Lecture on Biochemistry : Its Present Position and Outlook. Delivered in the University of Birmingham on May 29th, 1924.**—*Lancet.* 1924. June 21. pp. 1247–1252. [2 refs.]

Although the lecturer makes apology for an "almost trivial" survey of the biochemical field, since he has included neither the green plant nor microorganisms, he has here revealed a vision, ranging from the molecular structure and dynamics of self-regulated microcosms to the evolution of the phenomena of consciousness, which is very abundantly instructive and stimulative.

Biochemistry owes no direct obligation to the ancients. It began (with LIEBIG) in organic chemistry and a desire to isolate and determine the chemical composition of individual organic substances. But the living plant and animal were soon lost sight of in the excitement of synthetic manufacture of organic compounds, and the early achievements of biochemistry (in the case of animals) were limited to inferences, drawn from comparisons of intake and outgo, of processes intervening in the living body. In recent times biochemistry has been reanimated by contemporary advances in physical chemistry, particularly in knowledge of the properties of colloids and in more precise conceptions of factors—such as hydrogen-ion concentration—by which biochemical activity is conditioned; and again remarkably invigorated by exact knowledge of the molecular structure of living tissues, particularly of the protein-complex and of its individual constituents (amino-acids). For vague notions of protein metabolism we now have clear conceptions of a definite succession of biochemical activities—of the liberation of the individual amino-acids in the processes of digestion and of the stages of change which each one of them undergoes in its passage in the body. From this exact knowledge of the chemistry of living tissues, too, the biologist has come to " understand that underlying the morphological differentiation of species there is a chemical differentiation " having its primary seat in the proteins of the blood and tissues.

But the most pure and significant product of biochemical thought—emphasizing " the reality of the influence of molecular structure in the dynamic events of living matter "—comes from the discovery of the internal secretions (*e.g.*, of adrenalin, of which the molecular structure is known) and their prepotence, in extremely small amounts, in equilibrating the organism as a whole. Such co-ordinating functions were supposed to be the sole prerogative of the nervous system, but we now know that " underlying the influence of the nerves there is a chemical co-ordination," and are justified in thinking that many or all of the tissues and organs, apart from their special functions, contribute to the circulating blood secretions that work for the harmony and balance of the whole body. The equilibrium maintained in the circulating blood itself is a significant biochemical phenomenon, illustrating as it does " the stabilizing effect of perfect buffering in a fluid which constantly receives additions of acid or alkali without appreciable changes in the concentration of hydrogen ions."

The importance of chemical properties as resulting from molecular structure is also " beginning to be seen in the catalytic agencies which are contained in the essential make-up of each individual cell." Though nothing yet is known of the molecular structure of enzymes, yet " glutathione," a universal constituent of living cells, which " may be looked upon as a simple model of an enzyme," is known by its molecular properties to be autoxidizable and by its mere presence in the cell to ensure that a constituent part of the cell-system shall display dynamic properties.

The recognition of active specific catalysts within the cell weakens the belief that the " physical basis of life " is a peculiar molecule, and tends to render the term " protoplasm " an abstraction. " There is no such thing as living matter in a specific sense. The criteria of life are displayed by ‘ systems ’ in which catalysed reactions occur in a colloidal milieu. The special attribute of such systems from a chemical standpoint is that these reactions are organized,” not that the molecules are peculiar.

The lecturer briefly indicates some of the multifarious difficulties of biochemical research—due to the instability of living systems both in nature and in face of investigation—and some of the methods by which they are surmounted ; and he also refers to the importance in biochemistry of the infinitesimal—the prepotent influence exercised by substances present in minute concentration—the adjustments for which give a special stamp to biochemical work. He also gives us, incidentally, some idea of the high calling of the biochemist, who, apparently treating living matter with no more respect than dead matter, is really face to face with the organized (almost “ purposeful ”) reactions of self-regulated systems that in their higher developments are associated with the phenomena of consciousness and thus approach the veil of the unknowable.

A. A.

REVIEWS AND NOTICES.

VERDUN (P.) & MANDOUL (A.-H.). **Précis de parasitologie humaine. Parasites animaux et végétaux (les bactéries exceptées).**—3rd Edition. Revised. pp. 6+vi+937. With 434 figs & 4 coloured plates. 1924. Paris: Librairie Octave Doin, Gaston Doin, Éditeur, 8, Place de l'Odéon. (Collection Testut.) [Price 46 fr. 50.]

This excellent book worthily sustains the high standards of French tradition in its particular branch of educational literature, except, perhaps, that some of its illustrations are somewhat lacking in artistic finish. It covers the whole field of human parasitology, as above delimited, and does not wander too far outside it into over-long descriptive and taxonomic detail about things like blood-sucking flies, which—though to some extent concurrent with particular parasites, and to that extent imperative of recognition in a book dealing with those parasites—are themselves not parasites at all, either in their structural and biological adaptations, or in those environmental limitations that bring them within the same comparatively easy range of prophylaxis and treatment as parasites. In its plan and proportions the book follows well-approved lines; the parasites are grouped, defined, and arranged zoologically and botanically; each is concisely described, as also its development and its manner of spread and maintenance outside the host, and its way of access to and its development within its host or hosts; then its pathological effects and lesions on its hosts; and finally the treatment and prophylaxis. The information on all these points is up to date, though it may be noticed that Rhinosporidium is retained among the Protozoa, and the causative agent of trench fever is stated to be a spirochaete. An introductory chapter deals with such matters as the status and history of parasitology and the anatomical and biological characters of parasites—their atrophied organs, complicated and interrupted post-embryonic development, etc.

A. Alcock.

BABES (V.), BABES (A.) & BABES (Auriel A.) with BUSILA (V.), BUIA (I.), GHEORGHIU, SION (V.) & VASILIU (A.). **Travaux sur la pellagre exécutés sous la direction de V. Babes.**—*Annales de l'Institut de Path. et de Bact. de Bucarest.* 1922–23. Vol. 8. 312 pp. With 32 plates.

For very many years pellagra has been endemic in Roumania, and though, since the great war, the number of cases has decreased considerably the authors have had ample opportunity to observe the disease and to make pathological studies.

A full history of pellagra is given and the various etiological hypotheses are discussed. As might be expected in a work coming from Roumania the maize theory receives all attention and the other views practically none. In fact, the book is one more attempted vindication of the maize theory, which, in the view of many workers, is utterly untenable. It must be admitted that this bias goes a long way to lessen the value of the work.

Heroic attempts are described by which it was hoped that scientific evidence would be found for the theory that spoiled maize is intimately associated with pellagra. Unfortunately toxin neutralization methods, agglutination and complement fixation tests all gave negative results.

A chapter of real value deals with the role of gastric trouble in pellagra. Achlorhydria was found in more than 80 per cent. of cases, and the association of this condition with similar diseases such as pernicious anaemia and subacute combined sclerosis must not be overlooked in a search for the place of entry of infection.

It is refreshing to find that in the section dealing with neuro-pathology the often overlooked changes in the Betz cells are described.

The question of prevention and cure of pellagra is very thoroughly discussed, and in the latter, at any rate, the bias of the authors is not revealed and this part is therefore of greater value. Prevention methods fall into four headings. 1. By forbidding peasants to eat bad maize. 2. By the formation of pellagra hospitals, "Pellagroseries." 3. By the formation of pellagra colonies. 4. By "Commissions Pellagrologiques" for unifying results and encouraging research work.

In treatment the role of atoxyl is firmly stressed. This drug is given by injection of 10–20 cgm. every other day for ten days. Even children appear to tolerate the drug in this dose satisfactorily. The efficacy of the method is increased by giving "Acide Arsénieux" by mouth and by rubbing the patient with an inunction containing the same substance. There appears to be some clerical error in the dosage given with regard to these last methods so that the reviewer is forced to omit fuller directions.

To give some idea of the extraordinary success attained by the combined method of treatment the following facts may be quoted. In 14 cases all symptoms disappeared in 3–4 days; in 7 cases within 6–10 days, and in a further 8 cases within 10–28 days. These cases were re-examined after a period of six months and in none was a relapse recorded. For the stimulation of gastric secretion, "Eau de Slanic No. VI" is given.

These results are extremely interesting, and the authors claim that to the preventive methods already described and to atoxyl injection the marked decrease of pellagra in Roumania is directly due. An idea of the progress of the disease before these methods were introduced may be gained from the following figures:—

In 1892	16,500 cases.
,, 1896	13,000 ,,
,, 1897	19,000 ,,
,, 1898	21,000 ,,
,, 1899	32,000 ,,
,, 1910	53,480 ,,
,, 1911	80,000 ,,

Particularly worthy of praise are the beautiful plates illustrating the work. Some of these are in colours, and give an impression of the skin and tongue appearances which is wonderfully life-like.

It is difficult to do full justice to the enormous amount of observations and data collected together in this book. The attempt has been made, and we think successfully, to correlate all aspects of the disease and to apply new methods of research to old problems. The preconceived idea that bad maize is the cause of pellagra which dominates the whole work may, perhaps, be forgiven in view of the highly successful results in prevention and treatment attained in Roumania upon this assumption.

A. Douglas Bigland.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 3.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

ALBERT (August). **Neue Arsenpräparate zur Bekämpfung protozoischer Parasiten, insbesondere der Spirochäten.** [New Arsenical Compounds to combat Protozoal Parasites, and especially Spirochaetes.]—*Klin. Woch.* 1924. Nov. 25. Vol. 3. No. 48. pp. 2184–2185.

KALBERLAH (Fritz). **Zur Chemotherapie der Spirochätosen und Trypanosomiasen (Präparat "Albert 102").** [Chemotherapy of Spirochaetosis and Trypanosomiasis ("Albert 102").]—*Ibid.* pp. 2185–2189. [1 ref.]

The papers give a detailed account of the therapeutic action of a chemical known as "Albert 102." It is an organic arsenic compound which has a very stable molecule, and, like neosalvarsan, contains 20 per cent. of arsenic in place of the 34 per cent. of the old salvarsan. The drug has been tested on 400 rabbits and over 4,000 rats and mice, which were either healthy or suffering from rabbit syphilis, trypanosomiasis or relapsing fever. Over 2,000 injections have been made in human beings in the treatment of general paralysis, tabes, cerebral syphilis and multiple sclerosis. The outcome of the animal experiments is that the author finds the drug a very efficient remedy. The tolerated doses in grams per kilo. of body weight of "Albert 102," old salvarsan and neosalvarsan in mice are respectively 0·08–01, 0·18 and 0·37 ; the respective curative doses for *Trypanosoma equiperdum* infections are 0·005–0·006, 0·02 and 0·04 ; for relapsing fever 0·02–0·025, 0·0625, and 0·165. In rabbits the tolerated doses are 0·04–0·045, 0·1 and 0·225 ; the curative doses for these animals suffering from experimental rabbit syphilis are 0·0015–0·003, 0·01, and 0.02. It thus appears that the curative doses of "Albert 102" are considerably below those of salvarsan and neosalvarsan. In the treatment of the human diseases mentioned above intravenous injections of 0·05 gram. were first given. The dose was gradually increased up to 0·1 gram. and in certain cases of general paralysis up to 0·2 gram. As regards the number of doses it is stated that at least 25 must be given in cases of multiple sclerosis, while in general paralysis, chiefly with a view to estimating the tolerance, as many as 60 or 70 and in one case 150 injections have been made.

C. M. Wenyon.

(K2335) Wt P17 148 1,750 3 25 H & Sp Gp 52 12

i. Pons (R.). **Action *in vitro* du 914 sur des spirochètes en culture.**—*C. R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30 pp. 938–941. With 1 fig. [2 refs.]

ii. Pons (R.). **Action *in vitro* sur des spirochètes en culture, du sang, de l'urine et des organes d'un lapin novarsénié.**—*Ibid.* pp. 941–942.

i. As a result of numerous recorded observations it has been accepted that the organic arsenic compounds such as 914 have no action on spirochaetes *in vitro.* The author points out that in these experiments the time of observation has been limited by reason of the fact that spirochaetes commence to degenerate after five hours in pure defibrinated blood alone. To him it has always appeared possible that if observation had been continued longer some action of added drugs might have been seen. Having a well established culture, isolated from a type of recurrent fever, of a spirochaete to which he gave the name *Spirochaeta sinensis,* he tested the effect of the addition of varying quantities of 914 to the *culture media,* every care being taken to eliminate alteration in the reaction of the medium.

During the first ten hours, even with 1-100 concentration of the drug, no change occurred in the spirochaetes ; towards the 15th hour, however, there appeared to be a marked reduction in their number, and a loss of motility ; eventually all were destroyed and the culture was sterilized. The time required for complete sterilization varied with the concentration of the drug. Similar tests were made with cultures of *Bacillus coli* and Shiga's bacillus. In a comparative test it was found that 914 sterilized the bacteria cultures more rapidly (8 to 10 hours) than the spirochaete cultures (20–24 hours). The maximum dilution capable of killing the spirochaetes was, however, 1-200,000, as compared with 1-2,500 for *B. coli,* and 1-7,500 for Shiga's bacillus. The negative period which occurs before any action becomes apparent varies with the concentration of the drug. If the drug is first allowed to act upon blood or organ extracts there is a definite but slight activation, in that cultures of spirochaetes are killed in a slightly shorter time. [The name *Spirochaeta sinensis* was first proposed in the paper reviewed in this *Bulletin,* Vol. 21, p. 471, but was not, however, mentioned in the review.]

ii. This paper is a continuation of the preceding one and describes experiments designed to test the action of the blood and organs of rabbits dosed with 914 on the cultures of the spirochaete. A rabbit weighing 2 kilos was given 12 cgm. of 914 intravenously, and at intervals during the next 72 hours, 5 cc. of blood was drawn from the heart. The blood was added to 7 cc. of culture medium which was immediately inoculated with 10 drops of a rich spirochaete culture. Similar control experiments were made with a normal rabbit. In the case of the blood withdrawn at the 3rd hour after the injection of the drug all spirochaetes had disappeared in 35–40 hours, while in the control tube they were still living. Blood taken before and after the 3rd hour took a longer time to sterilize the culture. At 72 hours the blood had no action on the culture and behaved like the blood of the normal rabbit.

In another test the plasma was separated from the corpuscles, which were washed. The plasma alone had spirochaeticidal properties. Similar tests made with emulsions of the organs showed that the kidney tissue alone was active. The urine was strongly spirochaeticidal.

C. M. W.

KAMEI (Kasumasa). **[On the Easy Method of Demonstration of Spirochetes in the Blood. An Experimental Study with** *Spirocheta morsus muris* **et** *Spirocheta icterohemorrhagica.*]—*Chugwai Iji-Shimpo* (*Central Med. Jl.*). 1924. June. Vol. 43. No. 11. [Summarized in *Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. p. 237.]

The blood is centrifuged in hand machine till the cells have deposited. The fluid layer is then centrifuged in an electrically driven instrument at 3,000 revolutions per minute. The sediment is examined for spirochaetes.

C. M. W.

GOUZIEN (Paul). **La fièvre récurrente à spirochète d'Obermeier. Rapport sur l'enquête effectuée conformément à la décision du Comité de l'Office International d'Hygiène publique en mai 1923.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. June. Vol. 16. No. 6. pp. 731–780. [2 refs.]

The Committee of the International Office of Hygiene circulated a questionnaire with the object of obtaining information regarding relapsing fever in various parts of the world. The replies received form the basis of this comprehensive article, which gives a very good résumé of recent observations on the disease in all its aspects. From the practical point of view of sanitation it is convenient to consider the disease as of two types, viz., louse-borne and tick-borne. It is the former which is discussed at length in the report. The louse-borne disease is cosmopolitan and calls for the same international measures of control as have been recommended for typhus fever. In view of the possibility of hereditary transmission of the relapsing fever virus from louse to louse these will have to be even more stringent. From the information received there arise several points which require further discussion.

1. Would it be advantageous to replace the old name recurrent fever employed for the pyrexia caused by the spirochaete of Obermeier by a new one ?
2. Should the period of quarantine be 12 days, the maximum incubation period of the disease ?
3. Information is required regarding the length of time during which individuals once infected remain carriers of the infective organism.
4. If it is decided that measures of control similar to those employed against typhus ought to be adopted, what actually should these measures be ?

C. M. W.

WERNER (Joh.). **Einige parasitologische Beobachtungen bei artifizieller Recurrensinfektion.** [Parasitological Observations on Induced Relapsing Fever.]—*Ztschr. f. Hyg. u. Infektionskr.* 1924. July 3. Vol. 103. No. 1. pp. 157–161. [4 refs.]

Having employed a strain of *S. duttoni* for therapeutic purposes the author has been able to obtain definite information regarding the incubation period and relapses of induced relapsing fever.

The incubation period in human beings inoculated from mice at the height of their infection was 7 days when the injection was subcutaneous and 5 days when it was intravenous. Inoculating infective blood directly from man to man by the subcutaneous and intravenous routes, the incubation periods were 9 and 8 days respectively in the case of blood taken during the development of an attack, but 10 days if the blood was taken in the afebrile period. When mice were inoculated with blood taken from human beings at intervals during the afebrile period the incubation period was longest if the blood was taken on the first or second day. It decreased as the time of onset of the next attack approached. Inoculation of cerebrospinal fluid of human cases into mice produced infection in 8 days, though spirochaetes could not be demonstrated in the fluid.

In human beings the number of attacks varies from 2 to 7. On only one occasion has a relapse been noted in a mouse. The attacks last from 1 to 6 days, the first, as a rule, being the longest and associated with the highest temperature (40·6° C.). The interval between the first and second attacks is usually 5 or 6 days; between later ones it is 9 or 10 days. The longest interval was three weeks, which occurred between a 5th and 6th attack. Usually the blood remained infective to mice for 10 to 14 days after the last attack. On one occasion a reinfection was brought about one year after a previous one. Attempts to reinfect earlier than this failed.

An attempt was made to discover the survival time of spirochaetes in the blood and organs after death. The blood and organs, especially the brain, of a man who died during the height of a relapse and those of mice killed during the height of their infection were infective to mice for 96 and 120 hours after death. In the case of mice killed during the immune period following infection the brain alone is infective, and its infectivity lasts longer than that of the brain of a mouse killed during the height of the infection, an observation which suggests the presence of some resistant form of the spirochaete. Neither human beings nor mice acquired infection by the application of infective material to the uninjured skin. Mice, however, became infected when fed with bread soaked in infective blood. Intraperitoneal inoculation of mice with blood-free urine from cases at the height of infection did not produce infection.

C. M. W.

GUILLET. **Fièvre récurrente à tiques à Brazzaville.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan.-Feb.-Mar.-Apr. Vol. 22. No. 1. pp. 77-81. [2 refs.]

Towards the end of 1922 there appeared in the militia at Brazzaville a disease which, on account of the frequent occurrence of oedema and severe rachialgia, it was thought might be due to defective rations. It turned out to be tick fever, *Ornithodorus moubata* being discovered in large numbers. Some of the temperature charts showed only a single febrile period, others two with an interval of several days. The chief symptoms noted were severe headache and rachialgia which fixed the neck, jaundice, sometimes most persistent, and enlargement of the liver and spleen. Oedema of a hard type commonly occurred, about the shoulders, the arms, and the legs in the popliteal area and the calves. After the disease had been identified by discovery of the spirochaete, treatment with novarsenobenzol reduced the period of invaliding to 15 days.

C. M. W.

MARSEEW. [**Zur Epidemiologie des Fleck- und Rückfallfiebers in der Ukraine, Ende 1922.**] [Epidemiology of Typhus and Relapsing Fever in the Ukraine, End of 1922.]—*Prophylaktische Medizin* (russisch). 1923. Year 2. No. 1-2. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 310.]

The epidemic of typhus and relapsing fever in the Ukraine was a most serious one. The prisons were especially affected, as many as 60 per cent. of the cases in Kieff being amongst prisoners; and the outbreaks of epidemics can often be traced back to the prisons. The attention of the sanitary authorities is called to these diseases, which show no signs of abating in spite of improvement in the food conditions of the population.

C. M. W.

KENYA MEDICAL JOURNAL. 1924. May. Vol. 1. No. 2. p. 54.—**The Further History of the Case of Relapsing Fever referred to in the** *Journal of the Kenya Medical Service*, **March, 1924.**

The note refers to a case of relapsing fever in Kenya colony which is remarkable in that between the date of the first attack on Nov. 11, 1923, and the end of March, 1924, there were 10 relapses which occurred in spite of treatment with N.A.B. In all 4·3 gm. were given, 2·0 gm. intravenously and 2·3 gm. intramuscularly. Iridocyclitis appeared on Feb. 10, but it yielded readily to treatment.

C. M. W.

WELCH (H. V.). **A Point of Interest in the Treatment of Relapsing Fever.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. p. 149.

A case of relapsing fever which had been treated with two doses (·6 gm.) of 914 administered in the apyrexial period. A third attack brought him into hospital. Spirochaetes were present in the blood when a mild injected condition of the eye with slight photophobia rapidly developed into a sharp attack of iritis. Four days after admission the patient's temperature began to rise and he was given a dose of ·9 gm. of 914. The attack was completely aborted, but the iritis became worse. Five days later ·6 gm. of 914 was given. The iritis cleared up in 12 hours. The case shows that though 914 should be given while the temperature is rising, it may be of value in the intervals for the treatment of symptoms.

C. M. W.

i. SHAH (Wilayat). **A Few Brief Notes on Relapsing Fever.**—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 148–149.

ii. WELCH (T. B.). **Treatment of Relapsing Fever.** [Correspondence.]—*Ibid.* Oct. No. 7. p. 216.

i. The author, who has treated 84 cases of tick fever in Kenya colony, has convinced himself by comparative observations that N.A.B. has no effect on the course of the disease, and that to administer it is waste of money. No other arsenical appears to have been tried.

ii. The note by SHAH reviewed above has reminded the author that he had experience of relapsing fever in the same district some years before. A dose of Galyl was given at the first relapse and another a week later. The author feels certain that a number at any rate of the cases were completely cured, though he admits that there may be certain strains resistant to N.A.B.

C M. W.

SULDEY (E. W.). **Diagnostic *post-mortem* de la fièvre récurrente par la ponction hépatique.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 475–476.

The author has found that spirochaetes of relapsing fever may be demonstrated in films of material obtained by puncturing the liver 12 to 20 hours after death. In certain instances, when it is important to exclude death from yellow fever and an autopsy is not possible, the simple operation of liver puncture may give the diagnosis.

C. M. W.

WAIL (S. S.). **Die pathologisch-anatomischen Veränderungen der Blutgefässe beim Typhus recurrens.** [Pathologico-Anatomic Changes in the Blood Vessels in Relapsing Fever.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Vol. 240. No. 1/2. pp. 261–270. With 4 figs. [3 refs.]

In relapsing fever definite lesions of the walls of the blood vessels are a feature of the pathological changes. They are the result of alterations in the blood in the form of toxaemia and lipaemia. The endothelium injured by the poisonous substances in the blood becomes infiltrated with fat; it desquamates and may fill the entire lumen of a vessel. This degeneration occurs throughout the body, but falls most heavily on the liver and spleen.

C. M. W.

JOHN (Emil). **Impfungen mit der *Spirochaeta Duttoni* bei multipler Sklerose.** [Treatment of Multiple Sclerosis by Inoculation with *S. duttoni*.]—*Med. Klin.* 1924. Nov. 16. Vol. 20. No. 46. pp. 1610–1612. [13 refs.]

As no statements appear to have been published regarding the relapsing fever treatment of multiple sclerosis the author describes his experience in the treatment of nine cases of the disease by this method. In the case of a disease like multiple sclerosis, in the natural course of which remissions are common, great care has to be exercised before any apparent benefit can be attributed to any line of treatment. The author finds that he cannot recommend the treatment of the disease by superimposed relapsing fever as the method of choice.

C. M. W.

BONNE (C.). **Recherches sur les spirochètes de la spirochétose fébrile de Sumatra.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 623–628. With 1 fig. [2 refs.]

During the last few years observers in Sumatra have isolated leptospira from a series of diseases (benign febrile conditions of short duration without or with jaundice; severe febrile conditions with jaundice or with jaundice and haemoglobinuria) of various types resembling dengue, Weil's disease and blackwater fever. Whether the organisms from these various conditions are identical or not cannot as yet be stated, but VERVOORT has proposed the name *Spirochaeta febrilis* for the organism isolated from the mild disease. The author of the paper has investigated a strain of this organism and compared it with strains of *L. icterohaemorrhagiae* from Paris and from Amsterdam. The strain of *S. febrilis* had been originally isolated by inoculation of blood of a case of five-days fever into a guineapig from the blood of which cultures were obtained.

In culture *S. febrilis* was found to be a typical leptospira and differed in no way from *L. icterohaemorrhagiae,* unless in the rapidity of its growth in artificial media. In guineapigs it produced the same lesions as the organism of Weil's disease. Differences were met in the serological reactions (agglutination, lysis and protection of animals). While the Amsterdam and Paris strains proved to be completely homologous, the Sumatra strain differed in that sera which would produce complete agglutination and lysis in the European strains acted less vigorously on the Sumatra strain. Similarly a dose of serum which would protect a guineapig against the European strains gave inconstant results with the Sumatra strain. In spite of the similarity of the morphological and cultural characters of these organisms it is concluded that serologically the Sumatra organism differs from the others investigated. [The name suggested for the spirochaete by VERVOORT was *Leptospira pyrogenes* and not *S. febrilis* (this *Bulletin,* Vol. 21, p. 262, and below).]

C. M. W.

VERVOORT (H.). **Dengue-like Fevers in the Tropics caused by Spirochaetes. Spirochaetosis Febrilis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress. Singapore,* 1923. pp. 683–697. With 5 figs. & 6 graphs. [14 refs.]

This paper appears to describe the same observations as those recorded in an earlier paper (this *Bulletin,* Vol. 21, p. 262). It may be noted that the organism isolated from fevers of short duration, some of which were typically dengue, appears to be a leptospira which the author names *Leptospira pyrogenes.* Inoculated into guineapigs it gives rise to infections, some of which are severe and resemble experimental Weil's disease.

In addition to this organism another has been seen. It is referred to as a coarse spirochaete. It has been cultivated in horse serum medium but always in association with bacteria. The possibility of its being a contamination is recognized, as it was found in the serum of 3 sick horses. It was also seen in the ascitic fluid from a rabbit and guineapig. It is evident that the origin of this organism requires further investigation.

C. M. W.

VAN DE VELDE (E.). I.—**Spirochaetaemia in Tropical Fevers.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress. Singapore* 1923. pp. 644–651. With 12 figs. [1 ref.]

——. II.—**Spirochaetosis Ictero-haemorrhagica (Weil's Disease) in the Dutch Indies.**—*Ibid.* pp. 652–682. With 5 charts.

The first of these papers contains an account of the method adopted by the author to demonstrate spirochaetes in the blood. Thin blood films were stained by a modified Fontana method. In all 360 cases of fever were examined and spirochaetes, always in very small numbers, were found in the blood of 23. Of these cases 9 had malaria and 2 typhoid, so that the spirochaetes were found in 12 cases of fever the cause of which was not known. Two of these had definite symptoms of dengue. The description and illustrations of the spirochaetes are not very convincing. They do not show clearly the characters of leptospira. Some of them are coarse-looking organisms which in shape resemble forms commonly found in the intestine and might be considered as contaminations.

The second paper is a lengthy discussion on Weil's disease and experiments which were undertaken to prove that the disease occurs in the Dutch East Indies. There seems to be no doubt that typical cases do occur there, as indeed BAERMANN (this *Bulletin*, Vol. 21, p. 260) has already shown.

C. M. W.

i. KOSHINA (Yoshimori), SHIWOZAWA (Soichi) & KITAYAMA (Kichiro). [**On the Etiology of "Akiyami"' Harvest Sickness or Seven-Day Fever.**]—*Tokyo Igakkwai Zasshi* (*Jl. of Tokyo Med. Soc.*). 1924. Apr. Vol. 38. No. 4. [Summarized in *Japan Med. World*. 1924. Oct. 15. Vol. 4. No. 10. p. 268].

ii. ——, —— & ——. [**On the Relation between Spirochetes of "Akiyami" (Autumnal Disease) and the Rat.**]—*Iji Shimbun* (*Med. News*). 1924. May. No. 1140. [Summarized in *Japan Med. World*. 1924. Aug. 15. Vol. 4. No. 8. p. 203.]

i. The authors isolated 12 strains of spirochaete from cases of "Akiyami" harvest sickness, a disease occurring endemically in a county of the Shizuoka Prefecture. They could group them as A strains of high virulence, and B strains of slight virulence. In many ways the B strains agreed with the spirochaete of seven-day fever, but the A strains were clearly different from the spirochaetes of epidemic jaundice, seven-day fever and the B group. The differences were best demonstrated by agglutination and Pfeiffer's reaction, much less so by active immunization experiments.

ii. Field mice collected in a district where the disease was prevalent were found to be passing in their urine organisms which corresponded, when inoculated into the rabbit, with the leptospira of strain A.

C. M. W.

DELAMARE (G.). **Quelques conditions de l'exploitation sémiotique des spirochétoses bronchiques et intestinales.**—*Progrès Méd.* 1924. Oct. 4. No. 40. pp. 585–587. [2 refs.]

This paper is a discussion of the vexed question of the significance of the spirochaetes found in the mouth, bronchi and intestine. It is pointed out that those of the bronchi and intestine resemble morphologically those of the mouth and are given different names from the situations in which they occur. After reviewing arguments on both sides the author favours the view that the saprophytic spiral organisms of the mouth may occasionally assume pathogenic properties in different parts of the body. The multiplicity of symptoms ascribed to these infections renders the whole question a very complicated one; nevertheless, he believes that to regard the spirochaetes as sometimes pathogenic is better than ignoring their presence entirely. It has, however, constantly to be borne in mind that the presence of a large number of these organisms may mask infections with tubercle bacilli, spirochaetes of syphilis, cholera vibrios and *Entamoeba histolytica.* A diagnosis of spirochaetosis can only be made with the utmost circumspection and by elimination. The elimination, of course, refers to known causes of disease, but the author would no doubt admit that every new cause discovered would eliminate a number of the spirochaetal cases, a process which might ultimately lead to their complete disappearance.

C. M. W.

GREER (Alvis E.). **Spirochetosis Bronchialis (Castellani): Case Report.**—*Southern Med. Jl.* 1924. July. Vol. 17. No. 7. pp. 469–473. With 4 text figs. [66 refs.]

A general discussion of the condition known as bronchial spirochaetosis and the report of a case of the disease in the United States, where it is said to be more prevalent than commonly thought. The case described was of a chronic nature with a history of two years' illness. Though tubercle bacilli were not found it is of interest to note that X-ray examination of the patient's right lung showed a greyish opacity ranging from the right hilus towards the apex but not infiltrating the apex itself. It is remarked that spirochaetal bronchitis may be complicated by pneumonia or tuberculosis. [Would it not have been more correct to regard these diseases as complicated by spirochaetal invasion ?] A series of drawings shows the morphology of the spirochaetes of Vincent's angina, the mouth and the bronchi. In connexion with the latter certain granular bodies, which are assumed to be granular phases of the spirochaetes, are shown.

C. M. W.

CASSAËT (E.), BONNIN (H.) & GUÉNARD. **Sur quelques particularités de la bronchite sanglante de Castellani.**—*Gaz. Hebd. des Sciences Méd. Bordeaux.* 1924. Apr. 13. Vol. 45. No. 15. pp. 226–228.

The paper describes in detail a case of bronchial spirochaetosis in a woman in France. There was a persistent cough which was most troublesome in the mornings. The sputum was small in quantity, liquid and marked with small streaks of blood. From time to time definite haemoptysis occurred. The patient came under treatment for recently acquired syphilis but the drugs administered did not affect the bronchial condition. A careful examination revealed no lung disease and tubercle bacilli were not discovered. On the other hand, spirochaetes of various types, fusiform bacilli and other bacteria were found in the sputum. Radioscopic examination of the lungs after the introduction of lipoidol into the bronchi by intra-laryngeal injection revealed no dilatation. Various treatments were adopted, but none of these brought about a disappearance of the organisms. It is thought that the association of the spirochaetes with the fusiform bacilli is a strong argument in favour of regarding these organisms as identical with the spirochaetes and fusiform bacilli (*S. vincenti* and *B. hastilis*) of Vincent's angina and other conditions.

C. M. W.

DELAMARE (G.). **Au sujet de l'indice d'identification morphologique des spirochètes bronchiques.**—*C. R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1002–1004. [3 refs.]

Reference is made to the verdict of PONS (this *Bulletin*, Vol. 21, p. 734) on DE MELLO'S index for distinguishing spirochaetes, which consists in obtaining the mean length of 100 organisms and dividing this by the average number of coils. The author thinks that though DE MELLO'S method may not be reliable, something may be done by taking into account the length and the maximum height of the spiral turns.

C. M. W.

BROUGHTON-ALCOCK (W.). **Intestinal Spirochaetosis.**—*Jl. State Med.* 1924. Aug. Vol. 32. No. 8. pp. 387–392.

In this paper the author attempts to revive the view that a definite disease, intestinal spirochaetosis, exists. He confines himself to two organisms, *Spirochaeta eurygyrata* and *S. stenogyrata*. Only the former is supposed to be pathogenic, its special habitat being mucus, in which it sometimes occurs in enormous numbers. It is well known that these organisms occur, as the author describes, in certain chronic affections of the intestinal tract associated with mucus production, but he brings forward no new evidence of their pathogenicity. Having seen them on many occasions in diseases, the cause of which is unknown, he singles out the spirochaetes, as others have done before him, from the bacteria and cocci which are invariably present, and which might equally well be the cause of the disturbance. It is presumably because the organisms are spirochaetes and as such are more conspicuous than the commonplace bacteria and cocci that attention is directed to them. Something more than a record of their presence, even in large numbers, is required before they can be regarded scientifically as pathogenic organisms.

C. M. W.

WALDORP (C. P.). **Spirochétose intestinale.**—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 322–323.

Three cases of intestinal derangement associated with the presence of spirochaetes in the faeces are recorded. In spite of the long duration of the illness (24 and 21 years) in two of the cases a complete cure with disappearance of the spirochaetes was brought about by the use of stovarsol in one and bismuth salicylate in the other. It is supposed that a condition of gastric insufficiency allowed the oral spirochaetes to invade the intestine. In a discussion following the reading of the paper C. E. PICO points out that no proof of the pathogenicity of these spirochaetes had been produced and that it was impossible to state that these organisms alone were present. He believes that the condition of enteritis favoured the growth of spirochaetes in the intestine.

C. M. W.

i. DELAMARE (G.). **Spirochétoses intestinales.**—*Ann. de Méd.* 1924. Apr. Vol. 15. No. 4. pp. 315–364. With 2 plates & 2 figs. [122 refs.]

ii. OLLIVIER (Jean). **Les spirochétoses intestinales.**—*Progrès Méd.* 1924. June 28. No. 26. pp. 407–408.

i. The article is a comprehensive review of the literature dealing with the subject of intestinal spirochaetosis in all its aspects. The views expressed are the same as those which find a place in other papers by the same author reviewed in this number of the *Bulletin.* This article, in that the various points are more fully dealt with and that it is accompanied by a lengthy bibliography, should become a work of reference for all who wish to study the subject with a view to obtaining precise information regarding the relations of the intestinal spirochaetes to other saprophytic forms and actual evidence of the possibility of their pathogenicity, which at present is merely based on the number of spirochaetes present in certain cases and the absence of any other cause which can be demonstrated by the usual diagnostic methods.

ii. A general account of intestinal spirochaetosis, stimulated by the article of DELAMARE (*see above*). The author believes that there is no doubt as to its being a clinical entity.

C. M. W.

BROTZU (Giuseppe). **Un caso di febbre ricorrente in Sardegna.**—*Policlinico.* Sez. Prat. 1923. Oct. 15. Vol. 30. No. 42. pp. 1353–1354. With 1 chart. [3 refs.]

MANTEUFEL (P.). **Die kulturelle Anreicherung von Rekurrensspirochäten als diagnostisches Hilfsmittel am Krankenbett.**—*Arb. a. d. Reichgsndhtsamt.* 1924. Vol. 54. No. 3. pp. 337–339.

RISQUEZ (J. R.). **Estudio de la eliminación de espiroquetes en un caso de bronco-espiroquetosis de Castellani.**—*Gac. Med. de Caracas.* 1923. Nov. 30. Vol. 30. No. 22. pp. 342–344.

RAT-BITE FEVER.

ROBERTSON (Andrew). **Observations on the Causal Organism of Rat-Bite Fever in Man.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 157–175. [132 refs.]

This paper describes investigations conducted on the causative organism of rat-bite fever isolated from a case in England. It was studied chiefly in mice and young rats. Guineapigs were also inoculated, but, though they showed febrile symptoms, organisms were never demonstrated in the blood, though the serum developed the power of immobilizing the organisms in the blood of mice in twenty minutes. The chief interest in the paper lies in the conclusion reached that the organism with its rigid body and terminal flagella is not a spirochaete but a spirillum. It is further pointed out that the human strain cannot be differentiated from strains isolated from animals. In 1887, CARTER recorded *Spirillum minor* from the blood of rats in India, and this organism appears to be identical with the forms subsequently named *Spirochaeta laverani*, *S. muris*, *S. morsus muris* and *S. petit.* It is concluded that the correct name for the organism of rat-bite fever is *Spirillum minus* Carter, 1887.

The paper gives a good description of the organism which, apart from the flagella, varies in length from 1·5 to 10 microns, while the number of coils may be as few as one-and-a-half, or as many as eight or nine. The short forms which probably result from recent divisions have a single flagellum. The longer ones have a flagellum at each end. In stained films there may appear to be more than one flagellum at each end, but this seems to be the result of fixation, as the living organism shows only one.

C. M. Wenyon.

TEJERA (Enrique). **El "*Spirochaeta morsus muris,*" microbio del "Sodoku" en las ratas de Caracas.**—*Gac. Med. de Caracas.* 1924. Mar. 15. Vol. 31. No. 5. pp. 65–67.

The author has demonstrated the presence of the organism of rat-bite fever in ten per cent. of the rats of Caracas. The discovery leads him to suspect that the human disease will be found to occur in the same locality. He states that he has cultivated the organism in Noguchi's medium, and has reproduced the disease in rats by inoculating them with cultural forms. In the inoculated animals the organisms appear in the blood on the 7th day. They multiply, and after the 15th day they accumulate in large numbers in the connective tissues, especially in the submucosal tissues of the eyelids and tongue.

The majority of observers who have attempted to cultivate the organism have failed entirely, though ONORATO and SHIMAMINE (this *Bulletin*, Vol. 21, p. 740) claim to have done so in a special medium.

C. M. W.

CORINALDESI (Silvio). **Un caso interessante di Sodoku.**—*Riforma Med.* 1924. May 19. Vol. 40. No. 20. pp. 463–464. [9 refs.]

The paper records a case of rat-bite fever of exceptionally long duration. The patient, a woman of 51 years of age, was bitten in December 1919. The disease commenced with fever 15 days later, and from that time till July 1923 she suffered from periodic attacks. She came into hospital on July 12, 1923, during one of these attacks, and was treated with subcutaneous injections of atoxyl. She left hospital on August 2 and continued injections at home. When seen on November 20 she was in perfect health, and had had no further attacks. The diagnosis was made clinically, the attempts to discover the organism having given only negative results.

C. M. W.

REDDY (H. L.). **Rat Bite Fever** (*Spirochaeta morsus muris*).—*Canadian Med. Assoc. Jl.* 1924. Aug. Vol. 14. No. 8. p. 741.

A case of rat-bite fever in Montreal, of interest in that two doses of 0·3 gm. of novarsenobenzol given during the first attack and one week later did not prevent a second attack. A 3rd injection of 0·4 gm. of the drug brought about a remission of the fever in 6 hours. Three weeks later a third attack was experienced and was controlled in a similar manner. Weekly injections were then instituted for eight weeks, after which no further attacks were noted during two months' observation.

C. M. W.

SHATTUCK (George Cheever) & THEILER (Max.). **Rat-Bite Disease in the United States with Report of a Case.**—*Amer. Jl. Trop. Med.* 1924. Sept. Vol. 4. No. 5. pp. 453–460. With 1 chart. [8 refs.]

Description of a case of rat-bite fever in a baby 3½ months old. This appears to be the first case in the United States in which the diagnosis was confirmed by the discovery of the spirochaete, which was isolated by inoculating mice and guineapigs with blood from a vein. Examination of the local lesion and enlarged glands revealed no organism. The primary lesion, presumably the result of a rat-bite, was above the left eye, and, apart from fever, the patient suffered from enlarged glands and a rash which resembled that which may occur after the injection of serum.

C. M.W.

COLLIER (W. T.). **Two Cases of Rat-Bite Fever.**—*Brit. Med. Jl.* 1924. Aug. 16. p. 265. With 1 chart.

A record of two cases of rat-bite fever in Oxford, one caused by the bite of a cat and the other by a rat. Spirochaetes were discovered in the second case only, but both were typical and responded to treatment with novarsenobillon.

C. M. W.

MEHTA (Balkrishna N.). **Sulfarsenol in Rat-Bite Fever.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 567–568. With 1 chart.

A case which clinically appeared to be rat-bite fever in spite of failure to obtain any satisfactory history of a rat-bite was cured by two intramuscular injections of sulfarsenol. Two doses of 18 cgm. were given with an interval of six days.

C. M. W.

INFECTIOUS JAUNDICE.

BUCHANAN (George). **Spirochaetosis Icterohaemorrhagica. The Presence of the Causal Organism in Slime as a Source of an Outbreak in East Lothian.**—*Brit. Med. Jl.* 1924. Nov. 29. pp. 990–993. [15 refs.]

In connection with the outbreak of Weil's disease in Scottish mines, the author has made the most interesting observation that the slime on the roof of a certain mine contained scanty but typical leptospira, and that 4 cc. of the slime inoculated intraperitoneally to two guineapigs gave rise to a condition resembling in every way that produced by the injection of organisms from cases of the disease, the animals dying on the eleventh and thirteenth days. Abundant leptospira were present in all the organs examined, while an appreciable number were found in the blood and urine. There was intense jaundice, widespread subcutaneous, muscular and internal haemorrhages, enlargement of the spleen and haemorrhage in the stomach. The slime, which was with difficulty detached from the stone roof, was greyish-brown in colour and translucent when freed from carbon particles. Its consistency approached that of a thick gum solution, its temperature in February was 11·7°C., it was slightly alkaline when tested with litmus and had a reaction of pH 7·5 approximately. Other organisms were present and included algae, fungi, cocci, bacilli, spirochaetes, flagellates and nematodes and their ova. It is significant that when the outbreak of Weil's disease occurred work was being conducted in this particular section, which was known to be the wettest part of the mine. Eight miners developed symptoms of spirochaetal jaundice and five of them fell ill in a period of two weeks, while working in this wet cutting. Rats were never considered to be numerous in the pit, and an expert rat-catcher failed to trap any underground, though one animal caught at the pit surface was found to be infected with pathogenic leptospira. The bearing of the observations on the etiology of Weil's disease is carefully discussed and reference is made to the various records of the occurrence of leptospira in water.

C. M. Wenyon.

RAILLIET (G.). **A propos d'une petite épidémie de spirochétose ictérigène chez les baigneurs de la Vesle.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 13. Year 40. 3rd Ser. Vol. 48. No. 32. pp. 1502-1508. [6 refs.]

The paper describes a series of four cases of infectious jaundice which came under observation between the 15th and 25th August, 1923. All were in young men who frequented certain bathing places in the River Vesle near Rheims, and it is presumed that the infection was contracted there. An examination of the mud and water from the river revealed an organism resembling *Leptospira icterohaemorrhagiae,* which, however, was not pathogenic to guineapigs nor agglutinated by the specific serum of Weil's disease. About six weeks after this outbreak there occurred a more extensive one of what appeared to be benign catarrhal jaundice. In certain cases several members of one family were affected. The serum in one instance gave a positive reaction against *L. icterohaemorrhagiae.* In December a typical case of Weil's disease was observed. The outbreak persisted from October to February, and the author notes that at the time of writing the article in October, 1924, cases of the benign type were again appearing. He realizes the investigation is incomplete, but the association of the two types of case is sufficiently suggestive to indicate the necessity of investigating all epidemics of mild jaundice from the point of view of *Leptospira icterohaemorrhagiae.*

C. M. W.

TOHYAMA (Yuzo). **Experimental Studies and Actual Test Results concerning Prophylaxis of Weil's Disease (Spirochaetosis Icterohaemorrhagica) agriculturally viewed.**—*Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. pp. 193–198.

In this paper the author describes in greater detail the experiment which led him to the conclusions made in his earlier publications (this *Bulletin,* Vol. 21, p. 275). It is found that in experimental rice-fields the leptospira of Weil's disease will not thrive if the reaction of the water exceeds a certain degree of acidity, whereas if the reaction is alkaline or only slightly acid, as it is after use of the fertilizers commonly employed in Japan, the organism will live and remain virulent for about two months. Calcium cyanamide ($CaCN_2$), on the other hand, is not only beneficial to the crops, but kills the spirochaetes, and its use as a constituent of fertilizers is recommended. Practical tests in certain heavily infected areas fully justified the results obtained experimentally. An interesting point is that it appears that high incidence of infection amongst human beings is not associated with a corresponding increase in incidence amongst rats. The paper contains a large number of data relating to the chemical composition and reactions of the soil media in which the leptospira will thrive and the types of soil which are most suitable for its development.

C. M. W.

BONNE (C.). **Conservation du Spirochète ictéro-hémorragique dans les Punaises.**—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 242–243. [1 ref.]

The claims of BLANCHARD, LEFROU and LAIGRET (this *Bulletin*, Vol. 20, p. 582) that a disease resembling Weil's disease in equatorial Africa is transmitted by bed bugs led the author to investigate the possibility of transmission of Weil's disease from guineapig to guineapig by bed bugs in France. The bugs were fed on infected animals and afterwards on clean ones. In no case did infection result, though it was proved by the inoculation of crushed bugs into guineapigs that the leptospira could survive for two days in the bugs.

C. M. W.

ROBINSON (George H.). **Occurrence of** *Leptospira icterohemorrhagiae* **in Wild Rats of Baltimore.**—*Amer. Jl. Hyg.* 1924. July. Vol. 4. No. 4. pp. 327–329. [8 refs.]

About 7 per cent. of the wild rats of Baltimore are infected with *Leptospira haemorrhagiae.* Dark-field examination of kidney emulsions will give a larger percentage of findings than inoculation of guineapigs, as certain strains are without virulence for these animals. The carrier condition can be produced in white rats, the leptospira retaining its virulence for at least four months. It is amongst full grown rats that carriers are most likely to be found.

C. M. W.

GUITERAS, LEBREDO & HOFFMANN (W. H.). *Leptospira Icterohemorragica* **en la Habana.**—Reprinted from *San. y Benefic. Bol. Ofic.* 1921. Aug. Vol. 26. No. 2. p. 39. [1 ref.]

As *Leptospira icterohaemorraghiae* has been discovered in the rats of Havana the attention of the sanitary authorities is called to this disease, which in many respects simulates yellow fever. In countries where yellow fever is likely to occur the recognition of the differences between the two diseases is of considerable importance.

C. M. W.

COURCOUX (A.) & CORDEY (A.). **Spirochétose ictéro-hémorragique au cours d'une syphilis secondaire.**—*Jl. Physiol. et Path. Générale.* 1924. Apr. Vol. 22. No. 2. pp. 345–348.

The paper describes a case of Weil's disease in a man during treatment with mercury for secondary syphilis and after an incomplete course of novarsenobenzol. The diagnosis was confirmed by serological tests carried out at the Pasteur Institute.

C. M. W.

CARBO NEBOA. **[Primer caso de Leptospirosis ictero-hemorrágica en el Ecuador.]**—*An. de la Soc. Méd.-Quirurg. d. Guayas.* 1923. Vol. 4. No. 8. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 299.]

——. **[Leptospirosis Icterohemorrhagiae in Ecuador.]**—*An. de la Soc. Méd.-Quir. Guayaquil.* 1924. Feb. Vol. 4. p. 97. [Summarized in *Jl. Amer. Med. Assoc.* 1924. June 14. Vol. 82. No. 24. p. 1998.]

A record of three cases of Weil's disease in Ecuador. The organism was isolated by inoculation of guineapigs.

C. M. W.

VANNI (Vittorio). **Sulla chemioterapia della spirochetosi ittero emorragica.**—*Riforma Med.* 1924. Sept. 29. Vol. 40. No. 39. pp. 916–917. [3 refs.]

The author has found that tartar emetic has a spirochaetocidal action when added to cultures of *Leptospira icterohaemorrhagiae.* One centigram of the drug added to 1 cc. of culture will change the organisms to such an extent that they will no longer infect guineapigs. Treating animals after injection of 1 cc. of culture with repeated doses of tartar emetic has a definite effect on the course of the disease. If treatment is commenced before the liver has become seriously involved, the development of the disease is delayed to such an extent that death has been postponed from the usual day (3rd to 7th) to the 16th day. These results lead the author to believe that tartar emetic will be of service in the treatment of the human disease.

C. M. W.

CASTILLO. **Ueber pathologisch-anatomische Befunde und das Verhalten der Spirochäten beim experimentellen Morbus Weil des Meerschweinchens insbesondere über die durch Spirochäten erzeugten Lebernekrosen.** [The Pathologico-Anatomic Findings, and the Retention of Spirochaetes in Experimental Weil's Disease in Guineapigs, and particularly on the causing of Liver Necrosis by Spirochaetes.]— *Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 247. No. 3. pp. 520–530. With 3 text figs. [5 refs.]

A detailed histological examination of the tissues of guineapigs suffering from experimental Weil's disease shows very characteristic changes in the liver, in the shape of small necrotic areas which can often be detected only by microscopical examination. The periphery of each area is occupied by a tangled network of leptospira surrounding and enmeshing necrotic liver cells. There can be no doubt that these necroses are caused by the organisms and they may throw light on the lesions produced by other spirochaetal infections, such as syphilis.

C. M. W.

HIYEDA (Kentaro). **[On the Changes of the Arteries and the Condition of the Haemorrhages in Spirochetosis Icterohemorrhagica.]**—*Fukuoka Ikadaigaku Zasshi* (*Jl. Fukuoka Med. College*). 1924. Jan. & Mar. Vol. 17. Nos. 1 2 & 3. [Summarized in *Japan Med. World.* 1924. May 15 & Aug. 15. Vol. 4. Nos. 5 & 8. pp. 123; 206.]

In Weil's disease it was found that definite changes occurred in the elastic fibres of the arteries, while the muscle fibres were unaffected except in cases of long duration when there was some proliferation of the nuclei. These changes are responsible for the haemorrhages which are characteristic of the disease. They occur chiefly where the vessels branch. Haemorrhages into the intima and externa are often found, while infiltration with round cells occurs early in the disease.

C. M. W.

TROISIER (J.) & RIMÉ. **Réactions de floculation et séro-diagnostic dans le liquide céphalo-rachidien et dans le sang au cours de la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 912–917. [5 refs.]

Having under observation a case of Weil's disease which was characterized by severe meningeal symptoms the authors made a series of serological tests. It was found that agglutinins and lysins were present in equal amounts in the blood and cerebrospinal fluid. In each case a dilution of 1/1000 gave a positive reaction. The reaction of Guillain with colloidal benzoin was negative in every one of sixteen tubes of cerebrospinal fluid, a result which is the reverse of what occurs in syphilis of the nervous system. It appears evident that it is not the mere presence of immune bodies which brings about the flocculation in this reaction. Another reaction, that of Vernes, was tested. Two samples of serum taken on the 8th day of the illness gave figures of 1 and 3; on the 12th day it was 0 and on the 19th day 2. Thus, during the height of the illness and during early convalescence, very low figures were obtained, another instance of the difference between Weil's disease and syphilis. Further, the reactions of Wassermann and those of Bauer and of Hecht made on three occasions were entirely negative. These results illustrate the fundamental differences between the two types of spirochaetes, both of which with equal frequency give rise to meningeal symptoms. The case is described in detail, the final diagnosis having been made by the production of the typical picture in a guineapig inoculated with the cerebrospinal fluid withdrawn on the 7th day of the illness. The blood, urine and duodenal contents failed to infect.

C. M. W.

GARNIER (Marcel). **Remarques à propos de la communication de MM. J. Troisier et Rimé sur la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. July 17. Year 40. 3rd Ser. Vol. 48. No. 25. pp. 1092–1093. [2 refs.]

In two cases of Weil's disease TROISIER and RIMÉ removed fluid from the duodenum by means of the duodenal tube and injected it into two guineapigs on each occasion. None of the animals became infected. The present author points out that success could hardly have been expected, since bile and bile salts are known to destroy leptospira. He thinks that the disappearance of the organisms from the blood when jaundice develops may be due to the presence of bile. Guineapigs inoculated with virulent doses of leptospira together with bile do not become infected, but they develop no immunity and are easily infected later. The author also remarks on the failure of the above-named observers to infect guineapigs with the urine of their cases. He notes that the spirochaetes appear in this situation irregularly, and unless they are actually seen there after centrifugation there is little chance of infecting animals.

C. M. W.

PETTIT (Auguste) & ETCHEGOIN (Eugenio). **Sur la présence d'agglutinines pour le** *Spirochaeta icterohemorrhagiae* **dans le liquide céphalo-rachidien.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 918–919.

The cerebrospinal fluid in two cases of Weil's disease was proved to contain agglutinins for the specific organism. In one case the fluid was taken on the 8th day of the disease; in the other, which is the case reported on by TROISIER and RIMÉ, on the 23rd day. In the second case it is possible that the agglutinins resulted from the injections of antispirochaetal serum which were given, but this explanation does not apply to the first.

C. M. W.

VANNI (Vittorio). **Sopra un metodo di coltivazione della spirocheta ittero-emorragica.**—*Policlinico.* Sez. Prat. 1924. July 28. Vol. 31. No. 30. pp. 966–968. [4 refs.]

A method of culture of *Leptospira icterohaemorrhagiae* is described. A small piece of the liver of a guineapig is covered by a mixture of equal parts of physiological saline solution and horse serum. The horse serum used may be that issued in phials for therapeutic purposes. In this medium rapid growth occurs. The organisms have been cultivated from the urine of guineapigs and the author believes the medium will be useful for diagnostic purposes.

C. M. W.

TROISIER (J.). **Les séquelles rénales tardives de la spirochétose ictéro-hémorragique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 26. Year 40. Vol. 48. 3rd Ser. No. 22. pp. 910–911.

The author believes that a disease diagnosed as "hepatic typhus" in a patient 73 years of age was undoubtedly Weil's disease. Four years later the patient died with all the symptoms of a chronic nephritis which was confirmed at the post-mortem examination. It appears possible that the proclivity of the spirochaete for the kidney may be one of the causes of chronic nephritis.

C. M. W.

THOMAS (Roy E.). **Acute Infectious Jaundice. (With Case Reports.)**—*Southwestern Med.* 1924. July. Vol. 8. No. 7. pp. 314–318.

This paper describes 12 cases of the disease known as acute infectious jaundice, an epidemic of which recently visited New York State. The cause of the disease is unknown, and there is no evidence to show that it is *Leptospira icterohaemorrhagiae.* Catarrhal jaundice is probably a sporadic form of the disease.

C. M. W.

ANIGSTEIN (L.). *Leptospira icterohaemorrhagiae* **chez les rats sauvages de Varsovie.**—*C. R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1358–1359.

BEGER (H.). **Ueber aktive Immunisierung mit "gekupferten" Spirochätenkulturen bei der Weilschen Krankheit.**—*Arb. a. d. Reichgsndhtsamt.* 1924. Vol. 54. No. 3. pp. 355–360.

YELLOW FEVER.

NOGUCHI (Hideyo), MULLER (Henry R.), TORRES (Octavio), SILVA (Flaviano), MARTINS (Horacio), RIBEIRO DOS SANTOS (Alvaro), VIANNA (Godofredo) & BIÃO (Mario). **Experimental Studies of Yellow Fever in Northern Brazil.**—*Monographs of the Rockefeller Inst. for Med. Res.* 1924. Aug. 9. No. 20. 36 pp. With 3 text figs. & 5 plates. [26 refs.]. Also shorter version in *Jl. Amer. Med. Assoc.* 1924. Sept. 13. Vol. 83. No. 11. pp. 820–823. [22 refs.]

During the years 1921–1923 yellow fever has gradually increased in the towns in the interior of the State of Bahia, Brazil. As two commissions, one from the Oswaldo Cruz Institute and the other from the Institute of Hygiene, São Paulo, had failed to isolate *Leptospira icteroides* from these cases, the International Health Board sent an expedition under Noguchi. It was able to isolate two strains of *L. icteroides* from two of 9 cases of yellow fever in Villa Bella das Palmeiras, an interior town, by inoculation of culture media with blood drawn on the 1st and 2nd days of illness. With these strains, as well as with sera from nine recovered cases of the disease, a number of experiments were undertaken which proved the identity of yellow fever occurring in Ecuador, Mexico, Peru, Colombia and Brazil. The organism isolated in Brazil was not at first very virulent to guineapigs but the virulence was increased several thousand-fold by the 3rd passage. Two monkeys, *Cebus macrocephalus*, developed typical symptoms of severe yellow fever when inoculated with the Brazilian virus. One died on the 7th day and revealed the pathological changes typical of human yellow fever. Three African baboons and a monkey of the species *Ateleus ater* developed only slight fever on the 3rd or 4th day. In young dogs a severe and fatal infection with characteristic lesions was induced. It was demonstrated that the virus was capable of passing through the Berkefeld V and N filters. Guineapigs which had received 0·0001 cc. of anti-icteroides serum prepared in horses with strains of *L. icteroides* of Ecuador, Mexico and Peru were protected against 1000 minimum lethal doses of the Brazilian virus.

The monograph is illustrated by a series of coloured plates showing the character of the changes produced in the organs of the infected monkeys.

C. M. Wenyon.

NOGUCHI (Hideyo) & FRÓES (João A. G.). **Etiologia da febre amarella e reconhecimento na Bahia do** *Leptospira icteroides.* **Correspondencia trocada sobre esse assumpto entre os professores.**—19 pp. [31 refs.]. 1924. Bahia: Imprensa Official.

Certain correspondence which took place between the gentlemen mentioned on the subject of yellow fever in Brazil and the demonstration of *L. icteroides* in this country.

C. M. W.

NIGERIA. **Annual Report on the Medical Research Institute for the Year 1922.** [1923, Lagos: Govt. Printer.]—**Report on Yellow Fever Outbreak at Warri during October and November, 1922.** [YOUNG (W. A.), Assistant Bacteriologist, in charge of Branch Clinical Laboratory, Colonial Hospital, Lagos], pp. 39–40.

Dr. W. A. Young, the author of this note, went to Warri, S. Nigeria, to investigate an outbreak of yellow fever. Two cases occurred, one in an Italian who died before the author's arrival and the other in a native who did not become seriously ill till the 5th day, when he commenced to pass tarry stools and to bring up large quantities of black vomit. He was given 20 cc. of Noguchi's serum, after which his condition improved to such an extent that he made an uninterrupted recovery. The post-mortem findings of the fatal case were typical of yellow fever, except that the changes in the liver were more like those of Weil's disease. Histological examination of the tissues again showed a condition which would apply to Weil's disease rather than yellow fever.

C. M. W.

HOFFMANN (W. H.). **Kalkzylinder in den Nieren beim Gelbfieber.** [Renal Lime Casts in Yellow Fever.]—*Muench. Med. Woch.* 1924. July 4. Vol. 71. No. 27. pp. 898–899.

——. **Los cilindros de cal en los riñones, un nuevo signo diagnóstico de la fiebre amarilla.**—*Sciencia Medica.* Rio de Janeiro. 1924. June 30. Vol. 2. No. 6. pp. 284–285; and *Academia de Ciencias medicas, fisicas y naturales de La Habana.* Sesión ordinaria del 4 de julio de 1924. 3 pp.

——. **Is there Yellow Fever in Africa?**—*Jl. Trop. Med. & Hyg.* 1924. July 15. Vol. 27. No. 14. p. 199.

——. **The Histopathology of Yellow Fever.**—*Ibid.* Sept. 1. No. 17. pp. 235–240. [1 ref.]

——. **La histopatologia de la fiebre amarilla.**—*Rev. Med. y Cirug. Habana.* 1924. May 25. Vol. 29. No. 10. 4 pp.

The author has studied carefully the histological changes which occur in guineapigs infected with *L. icteroides* and *L. icterohaemorrhagiae.* The most striking result of this examination was the fact that the two experimental infections in these animals produced identical lesions which differed in a remarkable manner from the changes which were supposed to occur in human beings who had died of yellow fever. Fortunately, during the epidemic of the disease in 1906–1908 Dr. GUITERAS had preserved a large quantity of material from which the author has studied over 30 cases. It has resulted that the striking differences which were supposed to exist between the disease in man and animals actually do not occur. Further, there is a similarity between the lesions in man produced by Weil's disease and yellow fever, the only differences noted being those due to the greater severity of the latter, which produces certain characteristic changes in the liver and kidney. The chief points to be noted in yellow fever are as follows:—

Liver.—There is complete and fundamental destruction of the whole microscopical structure of the organ, so that in advanced cases it would be impossible to identify it. It has been claimed that the necrotic cells occurred in the intermediate zone of the acini only, and that near the central vein and periphery only fatty changes occurred so that the general outline of the acini was maintained. Of all the cases examined not a single one showed this picture, though it was found to occur in cases which were not yellow fever but septicaemia resulting from appendicitis. In Weil's disease such a high degree of necrosis is not usually found, though exceptionally an approach to the condition observed in yellow fever occurs. In the case of guineapigs infected with the organisms of both these diseases there is never necrosis of the cells but only cloudy swelling. It appears that the liver-cells of these animals are more resistant to the toxins than the liver-cells of man. Another characteristic feature of the human liver in yellow fever is the occurrence of phagocytosis of red corpuscles by the endothelial cells (Kupffer cells).

Spleen and lymph nodes.—The chief abnormality in these organs is the presence of large phagocytic cells which have ingested red corpuscles.

Kidney.—This organ next to the liver is most seriously affected, and the lesions which occur here are probably responsible for the deadly character of the disease. There is pronounced fatty degeneration and necrosis, with desquamation of the epithelium of the convoluted tubules and Henle's loops. Casts are formed, and what has not hitherto been noticed is the presence of lime casts which can easily be recognized in sections stained with haematoxylin. The formation of these lime casts appears to be pathognomonic of yellow fever as compared with Weil's disease, malaria, blackwater fever and relapsing fever. They do not occur in experimentally infected guineapigs, but have been found in young dogs. This particular feature, it is thought, will form a new method for differential diagnosis, and will be of particular value at the present moment in suspicious cases in West Africa.

Muscles.—Both the voluntary muscles and those of the heart show generalized hyaline or waxy degeneration of Zenker.

Stomach and intestine.—Apart from the well-known changes, the intestine showed a leucocytic infiltration of the solitary follicles and Peyer's patches.

Salivary glands and pancreas.—There is a slight degree of degeneration of the glandular cells.

Suprarenals.—These show only a slight degree of the degeneration which is so marked in the case of the experimental disease in guineapigs.

Other organs.—No changes which were not general throughout the body were noted. The walls of blood vessels, as in all the organs examined, revealed degenerative changes which are undoubtedly responsible for the characteristic haemorrhages which occur in the disease.

It thus appears that the human tissues are very susceptible to the toxins generated by the spirochaetes, while those of guineapigs are more resistant. The suprarenals alone appear to be more affected in these animals. The tissues of young dogs, on the other hand, occupy an intermediate position as regards their susceptibility.

C. M. W.

AGRAMONTE (Aristides). **Some Observations upon Yellow Fever Prophylaxis.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. pp. 285–287.

In this paper the author gives expression to his views regarding the etiology of yellow fever and warns sanitarians against the dangers which arise from the acceptance of *Leptospira icteroides* as the causative agent of the disease. Apart from the fact that several investigators have failed to isolate the organism from cases of yellow fever, there are other points in which the experimental results obtained with the organisms do not agree with the fundamental truths upon which all prophylactic measures have been founded. These are: 1. The parasite requires a mosquito as its intermediate host. 2. The parasite is present in the peripheral blood only during the first three or possibly four days of the disease. 3. A definite period of incubation, which is about 12 days, is required before a mosquito becomes infective. 4. The period of incubation in human beings is not greater than 6 days. Any prophylactic procedure which leads to a disregard of any of these fundamental truths is a danger. The prophylactic vaccine and the curative serum introduced by NOGUCHI come into this category, for the author believes that they are of very questionable value. Another result has been the attempt to establish the incubation period as 12 days as a result of experiments in animals, in spite of the fact that the investigations in man conducted by the Army Board in 1901 showed it to be 6 days.

The author is convinced that anything that tends to give rise to a feeling of false security, such as that engendered by so-called protective vaccination, leading to a neglect of those prophylactic measures which have yielded such satisfactory results in the field of practical sanitation, is to be deprecated. He thinks that until experiments on human beings have established the relation of *L. icteroides* to yellow fever and the influence of the vaccine and serum prepared from it the results of animal experiments should not be allowed to alter in any way the known methods of yellow fever control. When injected into guineapigs *L. icteroides* gives rise to a condition which is practically identical with that caused by *L. icterohaemorrhagiae*, yet in man yellow fever and Weil's disease are clinically and pathologically entirely unlike. The serological tests which differentiate these organisms are in his opinion insufficient to establish any specific difference, for in the case of other spirochaetal infections they merely indicate a difference in strain. He does not pretend to say what part *L. icteroides* plays in the pathology of yellow fever, nor does he cast doubt on the diagnosis of the cases from which it was isolated. He suggests tentatively that it may possibly be a symbiotic organism responsible for producing the haemorrhagic phase of the disease.

As regards the practical prevention of yellow fever, reliance is placed upon, firstly, the immunity of the individual, and, secondly, adequate prophylactic measures. The author believes that sanitary officers pay too little attention to the demonstrable rôle which children play in maintaining the endemic conditions in various localities. He thinks that the existence of the disease in such latent sources, as GUITERAS originally pointed out, is the cause of epidemics at long intervals without the introduction of new cases.

C. M. W.

MULLER (Henry R.). **Histopathology and Haematology of Experimental Yellow Fever.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 299–304. [3 refs.]

Young guineapigs, young puppies and a monkey (*Cebus macrocephalus*) experimentally infected with yellow fever revealed histological changes similar to those found in yellow fever in man. In guineapigs a steady and persistent leucopenia of moderate degree is the rule during severe infections. The number of red cells usually remained within the normal limits, though occasionally a marked reduction took place. The haemoglobin was usually normal. These findings are similar to those recorded for yellow fever in man.

C. M. W.

NOGUCHI (Hideyo). **The Etiology of Yellow Fever.**—*Proc. Inst. of Med. Chicago.* 1921. Vol. 3. No. 4. pp. 217–219. With 2 figs.

A brief summary of the investigations which have led the author to the view that *Leptospira icteroides* is the etiologic agent of yellow fever.

C. M. W.

PERRIN (Tomás G.). **La leptospira de Noguchi.**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1923. Aug. Vol. 2. No. 2. pp. 1–17. With 6 plates.

TORRES (Octavio). **O isolamento da "** *Leptospira icteroides* **" Noguchi na Bahia.**—*Sciencia Medica.* 1924 May 31, July 31 & Aug. 31. Vol. 2. Nos. 5, 7 & 8. pp. 219–241 ; 313–330. With 17 charts. 394–418. With 1 chart & 3 figs.

KALA AZAR.

KNOWLES (R.), NAPIER (L. E.) & SMITH (R. O. A.). **On a Herpetomonas found in the Gut of the Sandfly,** *Phlebotomus argentipes,* **fed on Kala-Azar Patients. A Preliminary Note.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 593–597. [8 refs.]

The authors have discovered that laboratory-bred *Phlebotomus argentipes* acquired a leptomonas infection after being fed on kala azar cases in Calcutta. A large number of wild flies, including *P. minutus* 207 males and 94 females, *P. argentipes* 317 males and 90 females, and 103 unidentified flies showed no infection. Further, 46 laboratory-bred *P. argentipes* fed on cases other than kala azar developed no infection. The flies fed on the kala azar cases were 56 in number, and 25 of these became infected. In 6 the infection was a heavy one. It is noted that Major SINTON points out that the known distribution of *P. argentipes* in India coincides with that of kala azar. The authors are careful to avoid speculation as to the bearing of these observations on the problem of kala azar transmission but they state that further experiments are in progress. They refer to MACKIE's (1914) discovery of leptomonas in sand flies in Nowgong [this *Bulletin*, Vol. 5, p. 282], and they believe this to be the only observation of the kind which has been made. The reviewer discovered flagellates of this type in sand flies in Aleppo.*

C. M. Wenyon.

SHORTT. **The Present Position as Regards the Problem of Transmission of Kala-Azar.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 8–18.

The author discusses the problem of kala azar transmission under the two headings, probable and possible theories. Under probable theories the bed bug and sand fly are considered, the former on account of its fitting in with house infection and the numerous experiments which have been made in connexion with the development of *L. donovani* in its intestine, and the latter because of analogy with oriental sore and the presence of natural leptomonas infections. Under possible theories other possible animal transmitters, including conorrhinus, fleas, mosquitoes, lice and ankylostomes are considered, as well as more direct methods through the mouth as a result of contamination of food from urine, faeces or sputum. The investigations which have been conducted under these various headings are reviewed, but it is admitted there are other fields for investigation which the paper does not cover.

C. M. W.

YOUNG (T. C. McCombie). **The Kala-Azar Transmission Problem** [Correspondence.]—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. p. 529.

The writer believes that the suggestion made by KNOWLES & DAS GUPTA of a latent form of kala azar in man fits in with his epidemiological experience of the extraordinarily sensitive response of endemic kala azar to any influences which act adversely on the public health.

C. M. W.

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* WENYON (C. M.). Note on the Occurrence of Herpetomonas in the Phlebotomus of Aleppo.—*Jl. London School Trop. Med.*, 1912. Vol. 1, Pt. 2, p. 98.

KNOWLES (R.) & DAS GUPTA (Biraj Mohan). **On Transient Infections with** *Leishmania donovani* **in Man and Animals.**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 292–295. [7 refs.]

In a previous paper (this *Bulletin*, Vol. 20, p. 866) it was suggested that there was some reason to suspect that symptomless cases of infection in man with *L. donovani* occurred. In the present paper cases are quoted which support this contention. In animals inoculated with kala azar virus one of four things happens. The animals may not become infected, they may acquire dermal lesions if the injection has been made into the skin, they may become infected but remain in perfect health finally recovering from the infection, or they may acquire what is to all intents and purposes acute kala azar. There is evidence that in human beings the same series of events may follow exposure to infection. In even the severest outbreaks of the disease only a limited percentage of the population die of the disease, a fact which suggests that certain individuals resist infection. It has been shown by BRAHMACHARI (this *Bulletin*, Vol. 19, p. 551) that *L. donovani* may produce cutaneous lesions. The mortality of known infected cases when left untreated is not cent. per cent., so that natural recoveries do occur. Further, the literature contains records of individuals who have been found to be infected with *L. donovani* though there were no symptoms of the disease. Two cases are quoted in which spontaneous recovery had taken place. The fourth type of infection in animals is represented by the typical picture of kala azar in man. The authors reflect that if infections with *L. donovani* in man are anything like what they are in animals it may be that kala azar in man is but the end-phase of a more widespread and usually symptomless infection.

C. M. W.

NICOLLE (Charles) & ANDERSON (Charles). **Recherches expérimentales sur le mode de transmission du kala azar. Deuxième mémoire.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 155–164. [1 ref.]

This paper gives an account of the results obtained by a continuation of the investigations previously described (this *Bulletin*, Vol. 20, p. 866) whereby the authors attempted to transmit kala azar from dog to dog by carefully arranged experiments with fleas. The attempt to maintain a virus in dogs by successive passages was made. It was first secured from a naturally infected dog on 28 December, 1920, and several dogs were inoculated on each occasion, so that for 9 passages at least one infection occurred. At the 10th passage 5 dogs were inoculated but no infection resulted. Another virus of canine origin is now at its 8th passage. Further experiments on attempted flea transmission were made as follows:—Two young dogs were exposed for 10 months to various batches of fleas which were collected from two known infected dogs over a period of 5 to 6 months. The fleas were introduced into the cage. The dogs were examined 2, 5, 7, 8, 9 and 10 months after the commencement of the experiment, and were finally killed. There was no evidence of infection, though they were infested with large numbers of fleas. Two other young dogs during the course of 3 and 3½ months were made to ingest 510 and 410 fleas collected from a known infected dog. Examinations similar to those in the first experiment were made, including culture from the spleen and bone marrow, and no infection was demonstrated. The authors conclude that they have reason to assert definitely that the dog flea plays no part in the transmission of kala azar from dog to dog.

C. M. W.

KNOWLES (R.) & DAS GUPTA (B. M.). **The Diagnosis of Kala-Azar by Examination of Thick Blood Films.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 438–440. [6 refs.]

The examination of blood for *L. donovani* by the thick-film method has enabled the authors to discover parasites in the peripheral blood of 67 per cent. of a series of 55 cases of kala azar. The technique is as follows:—Four drops of blood on a perfectly clean and grease-free slide are taken from a cleaned finger and mixed so as to cover an area of ¼ square inch. The film, covered with a Petri dish, is dried in the air or in the incubator at 37°C. for one to two hours. It is then flooded with the dehaemoglobinizing mixture (glacial acetic acid 2·5 per cent. in distilled water—4 parts; crystalline tartaric acid 2 per cent. in distilled water—1 part). The action should be complete in 5 to 10 minutes. The fluid is then tilted off and the slide is flooded with methyl alcohol which is left for one minute. The film is then thoroughly washed in distilled water to remove all trace of acid, after which it is stained with Giemsa stain (1 drop in 1 cc.) for 10 minutes. It is then washed in distilled water and allowed to dry by tilting it against any vertical surface. The parasites will be found in the leucocytes.

C. M. W.

SHORTT (H. E.) **The Relative Value of Diagnostic Methods, and Evidence of Cure in Kala-Azar.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 551–552. [2 refs.]

The author believes that as regards diagnosis of kala azar, culture from the liver gives as good results as culture from the spleen and that this is the surest means of discovering leishmania. Direct examination of smears from puncture material from these organs holds the second place, while the aldehyde reaction and examination of the peripheral blood are next in value. When the question of cures arises after treatment it frequently happens that the spleen has become so reduced in size that puncture of the liver is a more simple operation. In these cases culture from the liver is quite as reliable as culture from the spleen, and the author states that he has yet to meet the case in which the one organ has given a different result from the other.

C. M. W.

JEMMA (R.). **Considerations on the Diagnosis and Therapy of Leishmaniasis.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 228–232. With 1 plate.

This paper gives a summary of the author's experience with infantile kala azar at the Pediatric Clinic, Naples. He believes that the disease is spreading, quite apart from the fact that improved methods of diagnosis and the increased vigilance of practitioners in general are augmenting the opportunities for its identification. It appears that in Italy kala azar is most frequent in the first year of life. The value of examination of the bone marrow for diagnostic purposes is emphasized. As regards treatment, intravenous injections of tartar emetic remains the only reliable method. It is a good rule not to give large doses. A maximum dose of 3 to 4 centigrams twice a week for children under 3 years of age, or 4 to 5 when the children are older, will bring about cure in two or three months. As certain cases appear intolerant of tartar emetic it is well to begin with 2 centigrams. It has been found by experience that young children, especially those nursed by their mothers, do better at home than when removed to hospital.

C. M. W.

WAHED (A. K. M. Abdul). **A Few Practical Points in Kala-Azar.**—*Indian Med. Rec.* 1924. Dec. Vol. 44. No. 12. pp. 358–362.

The paper is the result of observations on over 1,000 cases of kala azar. The difficulty of diagnosing the disease from purely clinical signs, especially the type of fever, is emphasized. The failure of response to quinine is most important for excluding malaria. The author does not believe that autoclaving the solution of antimony tartrate increases its toxicity. On the other hand, from experience gained by 30,000 injections he finds that the use of an autoclaved solution never produces any serious symptoms. He has been accustomed to use a 4 per cent. solution of the drug, giving $\frac{1}{4}$ to 2 cc. for a dose. Mention is made of the cough and pains in the joints which sometimes follow these injections, but though distressing they quickly pass off. It is found that the difference between slow and rapid injection of the dose is negligible. If the patient suffers from bronchitis it is better to treat this condition with expectorants before commencing injections of tartar emetic. High fever, dysentery and diarrhoea do not contraindicate the drug. Other complications such as cancrum oris, skin diseases and oedema may supervene during antimony treatment, and each requires its own special line of treatment. A type of case which used to be termed the " lymphatic type " and is now known as the " thymic type " tolerates antimony treatment badly. Unless the anaemic condition of these cases can be dealt with there is little chance of succeeding with antimony injections.

C. M. W.

BASU (Indubhusan). **Analysis of 50 Clinically Diagnosed Kala-Azar Cases treated in the Out-Patient Department of Carmichael Medical College Hospitals.**—*Calcutta Med. Jl.* 1924. May. Vol. 18. No. 11. pp. 745–752. With 3 charts.

The paper describes the observations and treatment of the cases of kala azar mentioned in the title. The aldehyde test was positive in 33 and leishmania were discovered by liver puncture in 23 cases. It is stated that some of the cases showed considerable improvement and were even cured by intramuscular injections of quinine, but the evidence produced that these cases were actually ones of kala azar or that the cure claimed had really taken place is far from convincing.

C. M. W.

Basu (Sudhir Chandra). **A Note on an Epidemic of Kala-Azar with Typhoid-like Onset and Simultaneous Occurrence in Several Families in a Village in Bengal, including Short Reports of a Few apparently Similar Epidemics of Fever in some other Villages.**—*Calcutta Med. Jl.* 1924. Aug. Vol. 19. No. 2. pp. 58–72.

In Bahiria, a village of Bengal, shortly after a case of kala azar in a girl of 9 years of age was noted, an epidemic of a febrile disease suddenly appeared. About the middle of the first week in May a girl of 7 years of age was laid up with fever. The girl was sister to two boys who had been treated and cured of kala azar, one of them 12 years before. Within 3 days of the onset of her illness one of the brothers, aged 18 also felt ill, and 4 days later the other one, aged 20. Almost simultaneously the disease spread to other families, so that in the course of 10–15 days all the families living within a limited area of the village were affected. Some of the families had 3 to 5 cases. The area of the village in which the outbreak occurred was separated from the rest of the village and had 100 inhabitants in 25 families. All the 25 houses were involved except two which were occupied by single individuals. In all 52 persons suffered from the disease, but there was only one death, and this on the 40th day of illness. The fever from which the patients suffered was of the continued type, while diarrhoea and dysentery were commonly present. The spleen was not markedly enlarged. It could not be felt in 30 of the cases. As regards the diagnosis, typhoid fever and malaria were excluded. Spleen puncture in one case was carried out and leishmania were found. Treatment with antimony tartrate was then instituted in the village, with the result that the outbreak was controlled. The positive diagnosis in one case and the response of all to antimony treatment after failure of quinine leads the author to conclude that the epidemic of a disease with typhoid-like onset was one of kala azar. Mention is made of other villages in which similar epidemics have occurred.

C. M. W.

Dutt (Madan Mohan). **Certain Observations on Cases of Enlarged Spleen as met with in Bengal.**—*Calcutta Med. Jl.* 1924. June. Vol. 18. No. 12. pp. 789–793.

Attention is drawn to the occurrence in endemic centres of kala azar of cases of splenomegaly which are neither kala azar nor malaria, so that the custom of diagnosing as kala azar all cases of enlargement of the spleen which do not respond to quinine is erroneous. About 5 to 7 per cent. of the cases are splenomedullary leukaemia, while many of the kala azar cases are so atypical that apart from discovery of the parasite diagnosis is extremely difficult.

C. M. W.

Woltring (F. J. L.) & Hulk (J. F.). **Een geval van kala-azar.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 30. Year 68. 2nd Half. No. 9. pp. 1096–1112. With 5 figs. [17 refs.]

The paper describes a case of kala azar in an adult who returned to Holland from Pekin. As the patient had spent much time in the Dutch East Indies the authors take the opportunity of pointing out that the record of cases occurring endemically in those islands as made by De

Raadt (1909), Elders (1909), Neeb (1909) and Smits (1916) are unreliable. There appears to be only one authentic case on record, namely, that of Neeb (1920), and this was imported (this *Bulletin*, Vol. 20, p. 875).

C. M. W.

Lévy (P. P.). **Sur l'hématologie du Kala-Azar infantile (à propos d'un cas observé à Paris et terminé par la guérison).**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 477–482. With 2 charts in text. [7 refs.]

A study of the blood of a case of kala azar which was successfully treated with injections of stibenyl (this *Bulletin*, Vol. 20, p. 571)showed that the red blood corpuscles, haemoglobin and leucocytes, which revealed the usual mononuclear increase, gradually returned to their normal proportions as improvement occurred.

C. M. W.

Napier (L. E.). **The Problem of Cure in Kala-Azar.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 492–504. [6 refs.]

The question of the amount of antimony tartrate necessary to bring about a cure in kala azar and the criterion of cure have occupied the author's attention in previous papers. Various rules as to the amount of drug required have been formulated, but the subsequent relapse of cases which had been treated has proved that the rules were unreliable. Similarly, the view that with apparent return to perfect health accompanied by failure to cultivate parasites from the liver or spleen a cure had resulted has been found to be fallacious, for certain cases which passed these tests have relapsed, while others from which positive cultures were obtained have without further treatment recovered. With the object of obtaining more precise data the author has analysed the records of 153 properly diagnosed cases of kala azar which were treated at the Hospital for Tropical Diseases in Calcutta, and the present paper describes the results obtained. It is concluded that there are no absolute criteria of cure, the only satisfactory evidence being the subsequent history of the patient. Some cases are definitely resistant to the antimony tartrate treatment, and therefore do not come within any rules which can be laid down for the treatment of ordinary cases, in which the maximum total dose of sodium or potassium antimony tartrate necessary to effect a cure is 4 grammes per 100 lbs. of body weight. If there has been decided increase in weight, reduction of the spleen to the level of the costal margin or a reduction of 4 inches in cases of very marked splenic enlargement and increase in the white blood count to over 6,000, the case should receive 30 injections (2·55 grammes) if the temperature falls to normal by the 7th injection, 35 if the fall in temperature does not occur till the 10th injection, 40 if the temperature falls at the 16th injection, and the complete course of 45 injections or more if the temperature persists longer than this. The Anglo-Indian appears to be more resistant to treatment than the Indian or even European. Previous irregular treatment appears to encourage resistance, whereas relapsed cases do not show this resistance. The disease appears to be equally amenable to treatment at all its stages.

C. M. W.

BRAHMACHARI (U. N.) & SEN (Parimal Bikas). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part X. Further Observations on Quantitative Studies in Excretion of Antimony. The Influence of the Basic Radicle and of Repeated Injections of an Antimonyl Tartrate upon the Excretion of Antimony.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 113-126. With 2 charts.

The rate of excretion of antimony from the body in the urine was tested after the administration of single doses of various salts—tartar emetic, sodium antimonyl tartrate, lithium antimonyl tartrate, ammonium antinomyl tartrate, and urea antimonyl tartrate. The order of excretion during the first 24 hours is: 1. Lithium salt, urea salt. 2. Sodium salt, ammonium salt. 3. Potassium salt. The same order is followed when the observation is extended to 7 days. The order is not entirely due to their solubility, for the diuretic action of the lithium and urea salts has to be considered. When repeated injections of antimony are made, on the assumption that the total quantity given, less the amount excreted by the kidneys, represents the amount present in the tissues, it is found that the amount excreted by the kidneys is fairly proportional to the amount present in the tissues up to a limit. If the quantity present in the tissues is greater than this then the proportion excreted by the kidneys becomes greater. The limit is termed the maximum concentration in the tissues. It would thus appear that excessive concentration of the drug in the tissues is prevented by the power the kidney possesses of increasing its rate of excretion. It was found from an examination of different organs that the greatest concentration of antimony occurred in the liver. The data from which these rules have been adduced are presented in a series of tables and charts.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XI. The Value of Urea Stibamine in the Treatment of Early Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 397–402.

A series of 11 cases of early kala azar were treated with urea stibamine. The total quantity of drug given varied from 0·2 to 0·9 gram and the number of injections from 2 to 8. The disease was cut short in a remarkable manner in all the cases. A series of cases treated by SHORTT and FOSTER with similar results is also referred to.

C. M. W.

BRAHMACHARI (U. N.) & DAS (Judhistir). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XII. Some Observations on the Constitution of Urea Stibamine and Stibamine.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 423–426. [2 refs.]

When urea-stibamine was first described in 1922 it was regarded as a salt of urea and *p*-aminophenylstibinic acid, having the empirical composition $C_7H_{12}O_4N_3Sb$. Further analyses show that this formula is correct with the exception that the material contains in addition a molecule of water. Study of the reactions of the substance, however, indicates that it is not a simple salt of the two components as originally supposed, and it is now suggested that in its preparation (which is not described, but appears to involve the heating of urea with *p*-aminophenylstibinic acid) the urea undergoes at least momentary reversion to ammonium cyanate, which then dissociates, the ammonium radicle joining with a hydroxyl group of the stibinic acid residue, while the cyanic acid radicle attaches itself to what was the amino-group of the *p*-aminophenylstibinic acid.

$$\underset{\textit{Urea}}{NH_2\text{-}CO\text{-}NH_2} \text{ on heating} \longrightarrow NH_3 + HNCO \longrightarrow NH_3 + HO.CN.$$

$$\underset{\textit{Transformed urea}}{NH_3 + HO.CN} + \underset{\textit{p-Aminophenylstibinic acid}}{NH_2.C_6H_4.SbO(OH)_2} =$$

$$\underset{\textit{Urea-stibamine.}}{NH_2.CO.NH.C_6H_4.SbO\ (OH)\ (NH_4)}$$

Organic chemists will be interested in these singular reactions.

Stibamine, which is the sodium salt of *p*-aminophenylstibinic acid, is now shown to have the trimolecular formula, less two molecules of water, but the authors' attempts to write it correctly are not successful. Urea-stibamine (*see above*) and sodium glycyl-*p*-aminophenylstibinate (which it may be explained is amino-stibacetin) do not polymerize.

T. A. Henry.

SHORTT (H. E.) & SEN (Ram Taran). **Final Report on the Use of Urea Stibamine in Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 335–338.

The authors describe their treatment of a further series of 20 cases of kala azar with urea stibamine. The method of treatment was the same as that previously described (this *Bulletin*, Vol. 21, p. 254). The average duration of treatment in the 20 cases was 23 days and the average total quantity of drug given 2·6 grams. One case specially mentioned was in a condition of extreme cachexia, the spleen being the most prominent the authors have seen and containing extremely numerous parasites. The patient had already received 1,000 cc. of 1 per cent. sodium antimony tartrate and had progressively deteriorated. He was treated with urea stibamine and received 8·1 grams before sterilization was effected. Another case was treated with intramuscular injections of urea stibamine alone. Very slight pain was complained of, the case being cured by 12 injections (2·7 grams) in the course of 23 days. The authors consider that urea stibamine has been established as the most efficient drug at present in use for the treatment of Indian kala azar. The details of the 20 cases are set out in tabular form.

C. M. W.

FOSTER (Percy). **Urea-Stibamine in the Treatment of Kala-Azar under Tea Garden Conditions.**—*Proc. Assam. Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 24–26. & *Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 391–393. [3 refs.]

As all the cases of kala azar hitherto reported as being cured by urea stibamine had been in hospital under the best conditions, the

author was requested to try the drug under ordinary tea garden conditions in Assam. Twenty cases have been treated. The number of injections varied from 4 to 21 and the total quantity of drug from 0·35 to 3·20 gm. Of these cases one died from pulmonary complications, but all the others appear to have been cured. The doses used were mostly those recommended by SHORTT, but individual variations were made (this *Bulletin*, Vol. 21, p. 254).

C. M. W.

PRICE (J. Dodds). **Cases of Kala-Azar showing little or no Improvement with Sodium Antimony Tartrate, subsequently cured by Urea Stibamine.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 464–466.

The paper is based on experiences in the treatment of 8 cases of kala azar. The author still treats the majority of his cases with sodium antimony tartrate, but strongly urges that urea stibamine should be resorted to if after a few injections of antimony tartrate a patient shows no marked improvement. In addition to the 8 cases, 15 others have been treated with urea stibamine. No dramatic cures have been noted after 5 or 6 injections, the average number required being 14.

C. M. W.

ARCOLEO (Gaetano). **Ein Fall von Kala-azar bei einem Muselmann, der mit " Bayer 205 " geheilt wurde.** [A Case of Kala Azar in a Mussulman successfully treated with " Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. pp. 295–297.

A native of Tripoli suffering from kala azar diagnosed by spleen puncture was successfully treated with " Bayer 205." The patient was given five weekly doses of 0·1, 0·3, 0·5, 0·5, 0·6 gram of the drug. There were no symptoms of intolerance and within three days of the last injection the patient appeared to have made a complete recovery. Seen two months later, he was in perfect health.

C. M. W.

SIA (Richard H. P.). **A Simple Method for estimating Quantitative Differences in the Globulin Precipitation Test in Kala-Azar.**—*China Med. Jl.* 1924. Jan. Vol. 38. No. 1. pp. 35–42. With 2 figs. [2 refs.]

A method has been devised for making a quantitative estimation of the globulin precipitation from kala azar blood. In a small test tube 20 cc. of blood are quickly mixed with 0·6 cc. of distilled water. Without further agitation the mixture is allowed to stand. If there is a sediment the reaction is regarded as strongly, moderately or weakly positive according as the time required is 15, 30 or 60 minutes. If after one hour there is no sediment, but only a fine precipitate, it is very weakly positive, while a doubtful positive is represented by a haziness only in one hour. In treated cases of kala azar with improvement there is a change in the reaction which follows the above order.

C. M. W.

RAY (Charu Brata). **The Globulin Content of the Serum in Kala-Azar.** —*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 387–391. With 1 fig. [4 refs.]

In normal serum there are two principal varieties of globulin, euglobulin and paraglobulin. Of these the former, being insoluble in water, is supposed to be the true globulin and the latter pseudoglobulin, which is soluble in water. It has been found that there are two varieties of pseudoglobulin which are precipitated at different concentrations of salt. The details of the technique which gave these results are described. In kala azar, though the amount of serum proteids does not vary much from normal, the globulins are much increased, and this has special reference to the euglobulins. In normal serum euglobulin constitutes 7 to 8 per cent. of the total globulin, while in kala azar it is 40 to 50 per cent. This substance being insoluble in distilled water appears to be responsible for all the different blood tests in kala azar.

C. M. W.

AURICCHIO (Luigi). **Ricerche sulla glicemia nella leishmaniosi infantile.**—*Pediatria.* 1924. June 15. Vol. 32. No. 12. pp. 704–711. [5 refs.]

The sugar content of the blood was estimated in 12 healthy children, 5 of whom had been cured of kala azar, and 23 children suffering from the disease. In the healthy children the estimation gave figures varying from 0·091 per cent. to 0·108 per cent. with an average of 0·101 per cent. In the others it varied from 0·112 per cent. to 0·201 per cent. with an average of 0·142 per cent. It is evident that in kala azar the sugar content of the blood is increased, and this is attributed to the disturbance of the liver function caused by the disease.

C. M. W.

WAGENER (Edna Hannibal). **A Skin Reaction to Extracts of** *Leishmania tropica* **and** *Leishmania infantum*.—*Univ. California Public. Zool.* 1923. Dec. 31. Vol. 20. No. 22. pp. 477–488. With 1 plate. [14 refs.]

Rabbits were immunized by injecting intravenously suspensions of *L. tropica* and *L. donovani* obtained by diluting the deposit from centrifuged culture washings till each cubic centimetre contained one and a-half million organisms. The rabbits received 2 cc. of the suspension at 3-day intervals. Seven days after the last injection it was found that the serum contained specific agglutinins which gave complete agglutination of the homologous organism in dilutions of 1/980. A leishmaniosin, prepared by the technique of FORCE and STEVENS, was dissolved by grinding in a mortar with a weakly alkaline solution such as Coca's fluid, covered with toluol and allowed to stand at room temperature for 3 days. Similarly, the centrifuged deposit from cultures was diluted with Coca's fluid (sodium chloride 0·5 gram, sodium bicarbonate 0·05 gram, carbolic acid 0·4 gram, distilled water 100 cc.) till 1 cc. contained 2,000,000 organisms. This was covered with toluol and allowed to stand as in the case of the first extract. Normal and immune rabbits were tested by the injection of 0·2 cc. of these solutions into the skin. It was found that the immunized animals reacted. At the end of 24 hours in the cases of the second solution there was a small reddened papule which reached its height in 48 hours and persisted for 5 days. The centre of the papule consisted of an ivory white area 1 to 2 mm. in diameter. It was surrounded by an irregularly-shaped red halo. With the first solution the reaction differed little from that in control animals which reacted only in the appearance of a slightly indurated papule devoid of the white centre. The skin reaction was not specfic in that it was given by both organiams in the one animal.

C. M. W.

SHORTT (H. E.) & SWAMINATH (C. S.). **The Behaviour of Cultures of** *Herpetomonas donovani* **in Bed Bugs,** *Cimex lectularius* **Linn. and** *Cimex hemiptera* **Fabr.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 391-396. With 3 plates. [6 refs.]

CORNWALL and his collaborators have described in detail the behaviour of cultural forms of *L. donovani* in bed bugs which were undoubtedly *C. hemiptera*=*C. rotundatus* (this *Bulletin*, Vol. 19, p. 304). The authors decided to repeat the experiments by using the two species *C. lectularius* and *C. hemiptera* side by side. The former does not occur in the kala azar areas in Assam. As in CORNWALL's experiments, bugs were made to ingest cultures of the organism. In the main a confirmation of the previous results was obtained, but it was found that certain differences occurred between the two bugs and that these probably depend upon the fact that digestion of blood proceeds more rapidly in *C. hemiptera* than in *C. lectularius*. The greatest concentration of flagellates in the stomach is seen on the 6th or 7th day. In the case of *C. lectularius* intense concentration of flagellates is the rule, the midgut being filled with a seething mass of flagellates, well illustrated in the excellent figures of sections of this organ. This is partly due to multiplication, but the rapid absorption of fluid from the midgut is also responsible for the result. In *C. hemiptera* such concentrations were not seen. Furthermore, with less active digestion *C. lectularius* on an average retains its infection longer than *C. hemiptera*. Passage of the flagellates to the posterior narrow portion of the midgut occurs early in *C. hemiptera*. In *C. lectularius* it does not occur till the 2nd or 3rd day. The formation of the thick tails occurs less frequently in *C. hemiptera*. At no stage was any trace of an intracellular phase noted.

C. M. W.

ADELHEIM (R.). **Ueber Leishmaniosis infantum et canina in Riga.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Sept. Vol. 28. No. 9. pp. 367–387. [38 refs.]

Three months after the return of a Russian family from Turkestan to Riga it was found that a five-year-old daughter and a dog which had been brought back were suffering from kala azar. The virus from the dog was employed for experimental purposes. Mice, rabbits and guineapigs were inoculated subcutaneously. Only a certain number of the mice became infected. The disease in them lasted about six months and was usually fatal, though in some cases recovery occurred. The liver and spleen of the infected animals contained enormous numbers of parasites, while in two of 10 mice inoculated subcutaneously a local sore developed at the site of the inoculations and in them leishmania were demonstrated. In some cases the local sore with its parasites persisted while the generalized infection disappeared. An interesting observation was made on a healthy mouse which was kept in a jar for five months with an infected one. Both animals when killed were found to have numerous parasites in the spleen and liver. It is presumed that an oral infection had taken place as in many of the infected mice intestinal ulcers occurred in which leishmania were demonstrated.

C. M. W.

i. YOUNG (T. C. McCombie). **Fourteen Years' Experience with Kala-Azar Work in Assam.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 81–97. With 6 figs & 2 maps. [6 refs.] (Discussion pp. 98–107.)

ii. SOULIÉ (H.). **Sixième cas de kala-azar en Algérie.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 778–784. With 2 figs. [19 refs.]

iii. SABATINI (Luigi). **Caso di leishmaniosi infantile in Liguria.**—*Pediatria.* 1924. July 1. Vol. 32. No. 13. pp. 794–797.

iv. KASUGA (Kenzo). **A New Culture Medium for** *Leishmania Donovani.*—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore.* 1923. pp. 698–699. With 3 figs.

i. An abstract of the author's book on kala azar in Assam which has been reviewed in Vol. 21, p. 998, of this *Bulletin.*

ii. A description of the sixth case of infantile kala azar observed in Algeria, together with notes on the 5 cases previously recorded.

iii. Description of a case of infantile kala azar at San Remo.

iv. Till the author has satisfied himself that *Leishmania donovani* will grow in N.N.N. medium, which he seems to doubt, it is evident that the more complicated medium which he has found to be only fairly satisfactory need not be considered.

C. M. W.

AVARI (Khan Bahadur C. R.) & MACKIE (F. P.). **Canine Leishmaniasis in Bombay.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 604–605. With 1 fig. in text.

A pariah dog living near the Bacteriological Laboratory in Bombay was noted to have a superficial ulcer near the base of one of its ears. An examination of scrapings revealed leishmania. The authors also examined films made from a sore in a dog which were sent to them from the Punjab. In these also leishmania occurred. These two instances are the only ones in which natural leishmania infection of dogs in India have been observed.

C. M. W.

ROW (R.). **On Some Pathological Observations in Experimental Leishmaniasis in Mice with Special Reference to Generalised Infections set up by** *Leishmania tropica.*—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 435–438. With 2 figs. [7 refs.]

In a previous paper (this *Bulletin,* Vol. 5, p. 260) the author described generalized infection in mice resulting from inoculation with *Leishmania tropica.* Other observers, particularly GONDER and LAVERAN, have noted similar infections, but have described cutaneous lesions which occurred in association with the infection of the internal organs. As the author did not observe these cutaneous lesions he has repeated his previous experiments. Mice were inoculated with cultures of *L. tropica* obtained from a Cambay sore and other mice were subinoculated from the spleen of those already infected. The result has been that again generalized infections without cutaneous lesions were produced. They differed in no way from those resulting from *L. donovani*. A search for parasites in the intestine revealed them only in situations where lymphoid tissue occurred.

C. M. W.

TORRES (C. B. Magarínos) & LEÃO (A. E. de Arêa). **Leishmaniose e Blastomycose. (Observação de um caso de associação das duas molestias).**—*Sciencia Medica.* 1924. May 31. Vol. 2. No. 5. pp. 256–259. With 8 figs.

The case described was one of cutaneous leishmaniasis which was first seen with ulcerations on the nose, lips and neck. Tartar emetic treatment was commenced, and as the ulcers appeared to be healing the patient left the hospital after the sixth injection. He returned three months later with the disease in an aggravated condition. In addition to the original lesions there were others on the limbs and front and back of the thorax. It was found that the infection was a mixed one of leishmaniasis and blastomycosis. Tartar emetic produced severe reaction. Under arsenical treatment (914) and iodide of potassium the patient did not improve, and he finally died in a condition of extreme cachexia.

C. M. W.

CASTELLANI (Aldo). **Further Observations on the Treatment of Oriental Sore by Means of Phosphorus.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 1. Vol. 27. No. 19. pp. 263-264. [2 refs.]

The paper describes the successful treatment of 3 cases of oriental sore with phosphorated oil (this *Bulletin*, Vol. 20, p. 874). In one case 3 minims were injected into the skin ½ to 2 inches outside the nodule twice a week. The lesion disappeared in 6 weeks. In the second case injections were made into a nodular lesion twice a week for a fortnight while external applications of the oil were also made. There was severe reaction, so the oil treatment was discontinued. Hot fomentations were also used for the next 3 weeks. Healing was complete in this time. The third case was cured in a fortnight by application of oil to the sore every second day.

C. M. W.

KELAART (H. van Geyzel). **Brief Note on a Persistent Case of Oriental Sore of the Face, successfully treated by Phosphorated Oil. (Castellani's Method.)**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. p. 288. [3 refs.]

A record of an obstinate case of an oriental sore which had persisted for 18 months in spite of 3 prolonged courses of treatment with tartar emetic injections. Cure was brought about in 2 weeks by the application to the sore on alternate days of phosphorated oil. This case appears to be one of three referred to by CASTELLANI and noted above.

C. M. W.

SINDERSON (H. C.). **Emetine Hydrochloride in the Treatment of Oriental Sore.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 108–110.

The author has had very good results with the treatment of 22 cases of oriental sore by injecting a 5 per cent. solution of emetine into the bases and thickened margins of the sores. The cases supplied in all 64 sores, 2 of them having 21 sores between them. Not more than 20 minims of the solution was used at any one time and this quantity may be made to do for 3 sores. If there are more than 3 sores, two or three are treated at one sitting, the others later. Three or four days after the injection the sores become well-defined ulcers which, with ordinary surgical dressings, heal in about a fortnight. The after-histories of 16 of the 22 cases were traced. These represented 48 sores, which in only 5 instances showed any suspicion of recurrence after two months.

C. M. W.

i. DANIEL (L.). **Boutons d'Orient multiples.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 562–564.

ii. DEKESTER (M.) & MELNOTTE (P.). **Premier cas de leishmaniose cutanée observé chez un indigène au Maroc en dehors des zones sahariennes.**—*Ibid.* pp. 565–568. With 1 text fig.

iii. SERGENT (Et.). & GUEIDON (E.). **Chronique du bouton d'Orient en Algérie. Nouveaux cas sur le littoral (Clou de Mila).**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 181–182.

iv. MARIANI (Giuseppe). **Il primo caso di leishmaniosi cutanea autoctona nella provincia di Cagliari.**—*Giorn. Ital. d. Malat. Ven. e d. Pelle.* 1924. Oct. Vol. 65. Year 59. No. 5. pp. 1581–1604. With 2 plates & 1 text fig. [32 refs.]

v. GONZÁLEZ RINCONES (R.). **La leishmaniosis en Venezuela.**—*Cronica Med.-Quirurg. Habana.* 1924. Jan. & Mar. Vol. 50. No. 1, 2 & 3. pp. 19–29. With 26 figs.

vi. MARZINOWSKY (E. I.) & SCHURENKOWA (A.). **Oriental Sore and Immunity against it.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 67–69.

i. Description of a case of oriental sore in a Russian from Bushire.

ii. The title sufficiently explains the subject of this paper.

iii. In a previous paper the authors showed that a disease which had long been known as "Clou de Mila" was oriental sore. The present paper gives an account of 4 further cases from the same district.

iv. An account of a case of oriental sore in Sardinia together with a detailed description of the histopathology of the lesion.

v. A description of a series of cases of cutaneous leishmaniasis and the occurrence of flagellates, probably crithidia, in various plant bugs.

vi. This paper is the same as that reviewed in this *Bulletin*, Vol. 21, p. 726.

C. M. W.

BANERJI (Dhirendranath). **Kala Azar.**—*Calcutta Med. Jl.* 1923. Jan. Vol. 17. No. 7. pp. 7–42.

BRAHMACHARI (U. N.). **Toxicity of Some Antimonial Compounds and their Value in the Treatment of Kala-Azar.**—*Ibid.* pp. 1–5.

GHOSH (Raj Harinath). **Kala Azar. Introductory Remarks.**—*Calcutta Med. Jl. Ibid.* pp. i–viii.

NAPIER (L. E.). **Musings on the Problem of the Transmission of Kala Azar.**—*Ibid.* pp. 6–6b.

PERRY (H. Marrian). **Some Observations on the Occurrence of** *Leishmania* **in the Intestinal Tissues in Indian Kala-Azar: on the Pathological Changes occasioned by their Presence, and on their Possible Significance in this Situation.**—*Proc. Roy. Soc. Med.* (*Sect. of Trop. Dis. & Parasit.*). 1923. Feb. Vol. 16. No. 4. pp. 1–8. With 3 text figures.

LEPROSY.

ROGERS (Leonard). **The Croonian Lectures on Leprosy Researches.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 267–322. With 2 figs.

The first of these lectures is devoted to a general survey of the distribution of leprosy and of the factors influencing its spread, based on a consideration of previous records and the history of the disease. An attempt is made to show the correlation of inverse ratio between the prevalence of leprosy and tuberculization as evidenced by the von Pirquet test. The fallacies attendant on the interpretation of figures of prevalence are next pointed out, the text of the discourse being the apparent decline of leprosy in British India during the last 50 years.

Lecture II deals with the mode of infection and prophylaxis. The various ways in which the bacillus may gain entrance according to the views which have been put forward from time to time are briefly referred to, together with the possible effect of humidity in relation to leprosy, details of which have been given in previous papers by the author and reviewed in this *Bulletin* (see Vol. 20, p. 821).

Methods of prophylaxis as carried out in different countries, cold, temperate, and tropical, are mentioned, with statistical figures for each, and reasons for the failure of these methods, which consist mainly of segregation, are stated: the chief appear to be vacillating policy and defective administration. Measures to be adequate must include compulsory notification, isolation or institutional segregation of patients, examination of contacts at regular intervals, removal of children from their parents as soon after birth as possible, separation of the sexes in institutions, prohibition of lepers from engaging in the preparation and sale of food, in nursing and domestic employment, and, most important of all, treatment, thorough and early if possible.

From the point of view of the tropical worker the third lecture, on Treatment, will probably be of paramount interest. Previous modes of treatment by serums, vaccines, mineral preparations, and so on, are briefly reviewed, the remainder of the lecture being concerned mainly with chaulmoogra oil and its derivatives. The difficulties of estimating the effects of treatment are duly stressed, namely, the intermittent improvements which may take place spontaneously, and the comparatively sudden exacerbations arising in a disease with, typically, a chronic course; also the improvement in ill-nourished patients when placed under a good régime and properly cared for, even when no drugs are given. An interesting historical account of the use of chaulmoogra precedes a discussion of its various preparations and modes of administration.

Sodium gynocardate intramuscularly was found to be better borne by Indian patients than the whole oil, but preparations containing both gynocardic and hydnocarpic acids, injected intravenously, gave much better results. The author shows how, without any reaction noticeable to the patient, the bacilli may be broken down and the nodules absorbed, till, finally, bacilli are no longer detected either in the tissues or in the nasal mucus, so that in a case of average severity the patient became free of symptoms and infectivity in 6–18 months. Exceptionally, prolonged improvement may follow injection of a single small dose of the drug, e.g., 0·2 cc. of a 3 per cent. solution, but to ensure good results it is necessary in most cases to continue treatment regularly after clearing of symptoms and better for 12-18 months.

An account is given of the development of the idea that it is the unsaturated fatty acids which constitute the chief factor influencing the therapeutic value of oils in leprosy, so that many other oils besides that of chaulmoogra may prove beneficial in this disease. Although such good results were obtained by intravenous administration of the drug, the method has the disadvantage of leading to obliteration of the vein by its local irritant action. The results obtained by Professor DEAN, of Honolulu, and others with the ethyl esters from chaulmoogra also receive mention, but the author does not record any experiences of his own with these. They have the advantage of causing little or no pain when injected intramuscularly and are, therefore, more convenient for administration than irritating preparations intravenously.

The final pages of the lecture deal with results of treatment by ethyl chaulmoograte and hydnocarpates statistically compiled, showing that the degree of improvement depends largely upon the duration of the disease and the length of treatment. Thus, in Honolulu, of cases of less than 6 months' standing, 44 per cent. are stated to have recovered, but only 3 per cent. of those who had suffered for 8-10 years, while, as showing the influence of prolonged treatment, the percentage of those improved after 3 months' treatment or less was 26, but of those who submitted to 12-15 months' treatment 93 per cent. showed improvement. Finally, the question is asked: "Can lasting cures be obtained?" The author concludes that the outlook is hopeful, provided treatment is undertaken sufficiently early and continued sufficiently long. Most early and some more advanced cases lose all symptoms, and one patient has "remained free for over eight years from all signs of the disease . . . although he has had no treatment during the last three years."

H. Harold Scott.

IIIe Conférence Internationale de la lèpre, Strasbourg—28 au 31 juillet 1923. Communications et débats recueillis et colligés par le Dr. E. MARCHOUX.—528 pp. With 1 plate & 89 figs. 1924. Paris: Librairie J. B. Baillière et fils, 19, rue Hautefeuille.

This handsome volume of 528 large pages appeared late in 1924; much of its information has already appeared elsewhere, and been referred to in this *Bulletin*, so that only a brief summary of its more important items need be given here.

After opening speeches a sitting was devoted to statistics on the incidence of leprosy in various parts of the world, which brought out little new. It indicates a further decline of the disease in the Maritime Alpes, Norway, Sweden and the Baltic Provinces, States of Livonia and Esthonia, largely due to the death of a number of lepers during the war in the last mentioned area. In Russia the present numbers are quite unknown; in Japan leprosy is said to be decreasing yearly as the result of prophylactic measures, the number known being placed at 16,261 in 1919, which is far less than some earlier estimates; in Brazil 7,224 cases were registered in 1921, but there are many unknown cases. A number of the French tropical colonies, particularly Cameroun, are severely infected, the sum total being estimated at 80,000. The Belgian Congo is infected throughout with unknown numbers.

Etiology was dealt with at the second sitting, which opened with a paper on the relation of leprosy to humidity by L. ROGERS (this *Bulletin*, Vol. 20, p. 821). Then followed an important paper by the Secretary of the Congress, M. E. MARCHOUX, on rat leprosy and its transmission to man, in which he showed that the bacillus is rapidly killed by drying or by a temperature of 60°C., cannot be cultivated, and is as essentially parasitic as the human form, while it can readily be inoculated through a slight abrasion of the skin, or even through epilation ; these observations strongly suggesting a similar mode of infection in human leprosy, through close association with an infective leper. The bacilli in both forms may also remain long latent in lymphatic glands, the organism being anaerobic according to this worker. The vexed question of the cultivation of the lepra bacillus was inconclusively discussed by KEDROWSKY and others, and Professor STANZIALE spoke on his well-known work on inoculation of rabbits' eyes with leprous material. A. PALDROCK of Dorpat described branching lepra bacilli containing acid granular bodies, which he considered to be reproductive elements, but MARCHOUX pointed to the low resisting power of the organism as opposed to this theory.

The third sitting, devoted to the comparative pathology of leprosy, began with an interesting paper by MARCHOUX on the progress of the infection in which he showed the close similarity with tuberculosis. Latent leprosy with spontaneous cures is believed not to be rare, and concomitant infections may favour the development of active leprosy, as has also been shown by MUIR, whose paper on the nomenclature of leprosy follows. The disease is divided into quiescent, inflammatory and resolving phases of activity applicable to all cases, and into dermal, including nodular and diffuse varieties, and nervous, either of ascending or metastatic distribution.

A number of clinical papers follow, the most interesting being J. DARIER's on tuberculoid lesions closely resembling those of lupus, containing extremely few bacilli and occasional giant cells and showing alterations in sensibility. [Similar cases have been described by MUIR in India, where they are common.] Professor JEANSELME, the President, and others, discussed the pigmentary, and M. HIRSCHBERG the bony changes in leprosy, while Professor G. H. MONRAD-KROHN of Christiania dealt with the neurological aspect on the lines of his recent book. K. MITSUDA of Japan describes a reaction at the site of injection into the skin of an emulsion of a fresh leprous tubercle broken up and boiled for two hours in water and diluted to contain 1 gramme in 10 cc. of 0·5 carbolic acid, the dose being 0·05 cc. In 403 lepers a hyperaemic reaction appeared at the end of 48 hours, which disappeared completely in a few days in nodular cases, but in 79 per cent. of macular and nerve cases it increased up to 15 days to form a papular infiltration lasting for over a week. In old persons not associated with lepers and in a healthy attendant (for twenty years) on lepers similar prolonged reactions were met with, and MITSUDA considers that healthy attendants should be thus inoculated to increase their resistance, as the slight short reactions in nodular lepers are thought to be a sign of absence of any resistance. The same worker discussed the question of the curability of leprosy, pointing out that though there is a tendency for the less resistant macular cases to become nodular and the more resistant to develop into the nerve form, all forms may disappear sooner or later and some cases clear up completely. The Bordet-Wassermann reaction in leprosy was next discussed without much result, and Dr. M. Guillen described a particular albuminous reaction as diagnostic of leprosy. The same worker, after pointing out that successful treatment depends on early diagnosis, describes the first symptoms in order of frequency as (1) nervous symptoms of pain, atrophy or anaesthesia; (2) affections of the skin of the face and extremities and (3) obstruction and the formation of crusts in the nose.

An important section on Treatment brings out a very general consensus of opinion of the great value of the new methods of injecting the soluble products of chaulmoogra oil, especially in the form of the ethyl esters, while some remarkable results are also recorded by K. Mitsuda with the prolonged use of injections of chaulmoogra oil itself, a number of photos illustrating the results of such treatment continued in most advanced nodular cases for from two to five years being reproduced. R. F. Parra and J. E. Santos, reporting on the extensive use of the esters in Colombia, tabulate 127 cases, the great majority of which, especially the nodular cases, showed improvement, though final conclusions regarding ultimate results must be awaited. E. Rabello & I. Vernet of Brazil come to very similar conclusions, but add that ethyl chaulmoogrates may also be used in prophylaxis. Dr. Gouzien, the head of the French Colonial Medical department, reported favourably on the use of the new methods by various French Colonial medical officers, but points out that great care is required in the case of leprosy complicated by tuberculosis. Papers by M. Robineau and by L. Rogers deal with methods which have already been reviewed in this *Bulletin*, as do those of H. Gougerot on injections of eparseno, which have not fulfilled the expectations aroused by the first reports, and of A. Paldrock on the local application of carbonic acid snow. In the final resolutions the necessity of supplying the best treatment in all leper institutions was emphasized.

Prophylaxis provided some interesting papers. E. Marchoux, in discussing the mode of contagion, considered that latent unrecognized cases might be more dangerous than obvious ones, since they are not avoided. E. Rabello & J. Motta report the great efforts now being made by the Brazil Government to deal with lepers in accordance with rules drawn up by Dr. C. Chagas in 1920, including compulsory notification and hospital or domiciliary isolation, the former preferably in agricultural colonies; marriage of lepers is permissible only under condition of the separation of any infants from birth, these measures being in accordance with the resolutions of the Rio de Janeiro leprosy commission of 1918; the Brazil Government has also made it obligatory on all medical students to be instructed regarding leprosy, an advance which should be introduced into all leprosy infected countries. The Government has voted 6,000,000 francs annually for the work, 1,823 of the 7,220 known lepers are already isolated, and six more colonies to accommodate 5,600 lepers are being arranged for; when these are completed Brazil will have set an example to other nations in her liberal provision for lepers. An American Leprosy Conference at Rio de Janeiro in October, 1922, recommended meetings every fourth year, and the formation of associations in each country to further prophylactic and research work on leprosy. An association for the help of lepers is being formed in Brazil.

Japan, in 1917, also made important advances in prophylaxis, as described by K. Mitsuda, arrangements being made to enlarge the five leper hospitals to accommodate 4,500 patients, including the greater part of the contagious cases, as well as a hospital for the close study of 500 cases. The difficult question of the separation of the sexes has been carefully considered, the advisability of separation being weighed against the danger of formation of unnatural habits. During the last nine years 170 males have voluntarily submitted to vasectomy to prevent the procreation of children born to danger or misery, the fact that in progressive cases sterility ensues sooner or later as a result of the disease being cited in favour of this procedure. [The Americans have also adopted this wise measure in Panama.] Age figures show that 41 per cent. came to hospital by the age of 20 and 63 per cent. by 25, and 4 men were admitted to 1 woman, although the proportion in the whole country is 2½ to 1, while 58 per cent. were nodular, 31 per cent. anaesthetic, and 11 per cent. macular. The most frequent causes of death were pulmonary tuberculosis 28 per cent., nephritis 20 per cent., and pneumonia 5·6 per cent. In Cambodia C. MATHIS says that the lepers there were recently officially estimated at 1,200 in a population of 2,500,000, and that nothing appreciable has yet been done to deal with the problem ; he advocates compulsory isolation of begging lepers. L. ROGERS deals with the present position of prophylaxis in British Colonies, and shows that while compulsory segregation has been followed by considerable diminution in the number of known lepers in those West Indian Islands that enforced it, an increase took place in those which neglected the measure, while little has yet been done in our badly infected tropical African possessions, where the problem is a most difficult one. The African problem is also dealt with by M. ROBINEAU in connexion with the badly infected Cameroons, where it is one of the chief medical problems, and there are now 578 lepers in three leprosaria, together with five villages containing 179 among 125,000 inhabitants in the Ebolowa division. The greatest difficulty is experienced in collecting the lepers, attempts to do so through the native chiefs or through guards failed completely ; the only successful plan is to send selected lepers in pairs touring through the infected villages, who explain the care taken of them in the settlements, with the result that they generally return within a week bringing 10 to 15 new lepers with them. H. C. de S. ARAUJO gives a long account of prophylaxis in Guiana and Trinidad, including an interesting description of the new Trinidad settlement on the Island of Chacachacare, which will be a great improvement on the Corcorite asylum in the suburbs of the capital of the colony.

The last section dealing with legislation opens with a paper by E. MARCHOUX, in which he pleads eloquently for abandoning the harsh measures of the middle ages, and for treating leprosy on similar lines to the closely allied tuberculosis, the latter being the more infectious and dangerous of the two. Hospitals and dispensaries within reach of the patients' friends should be provided in place of distant segregation, special attention being paid to early diagnosis and efficient treatment ; the marriage of lepers among themselves should not be forbidden as long as any offspring can be removed from their care, and the Norwegian mild isolation measures should be carried out, although under certain circumstances more severe measures may be necessary to deal with wandering lepers. For these purposes compulsory notification, with domiciliary isolation where practicable, and for others, especially indigents, comfortable leper homes, or, as in Annam, a leper quarter in the villages. The isolated patients should be efficiently treated and provided with employment and amusements, and the people instructed in the precautions necessary to avoid infection from lepers. Other papers give the laws in Brazil and in Japan, and the report ends with the resolutions of the congress.

L. Rogers.

MARCHOUX (E.). **A Lepra em nossos dias. Etiologia-Prophylaxia.**—*Rev. Med.-Cirurg. do Brasil.* 1924. July. Vol. 32. No. 7. pp. 339–354. [3 refs.]

The first part of this paper might serve as an introduction to the bacteriology of leprosy The second deals with rat-leprosy and points out analogies between it and the human disease. There are certain morphological differences in the organisms, notably the terminal swelling of the bacillus in the rat form ; also it is readily inoculable and may be transmitted by flies direct, but not after an interval of more than 24 hours. There is no evidence of any insect vector in the true sense. Intraperitoneal inoculation produces extensive visceral lesions. In the rat, as in man, cases of latent leprosy occur, *i.e.*, infected individuals showing no clinical signs of the disease. Cases in which the leprous lesion is small may undergo spontaneous cure. Emulsion of the spleen pulp of a leper was injected into a rabbit, a guineapig and six rats. Five of the last became infected, but not the others. The question of the susceptibility of man to the rat form is not decided.

H. Harold Scott.

COOK (Cecil). **Leprosy in Australia.** [Correspondence.]—*Med. Jl. Australia.* 1924. Sept. 27. 11th Year. Vol. 2. No. 13. pp. 336–337.

The writer states that in spite of leprosy having been a notifiable and quarantinable disease for three decades it is still as prevalent as ever in some of the States. This he attributes to the early stages not being recognized or not reported by medical men, since in the case of a small outbreak among the natives at Roebourne, Western Australia, prompt isolation of the first four cases stamped out the disease, as should be possible in other places. In Queensland only cases found to be bacteriologically positive are isolated, but arrangements should be made to examine all cases at regular intervals to detect the early infective stage, while cases outside the lazarets should receive no regular treatment ; as is not yet the case. Medical men should be taught to recognize early cases, and sanatoria-like conditions should be provided for lepers.

L. R.

PAGÉ (J. D.). **Leprosy in Canada.**—*Canadian Med. Assoc. Jl.* 1924. Sept. Vol. 14. No. 9. pp. 824–825.

Leprosy was first discovered in New Brunswick in 1815 and a lazaretto built at Tracadie in 1844, to which lepers were admitted later from other parts of Canada, the Federal Government taking it over in 1869. A few years later the D'Arcy Island lazaretto was opened in British Columbia; it has recently been transferred to Bentinck Island, and now has nine patients, while Tracadie has ten, only four of whom now show active disease, the rest being mutilated quiescent cases. The average physician fails to recognize the early stages which may be a danger to others. The importance of early diagnosis cannot be too much emphasized, because if a leper is discovered within five years of his arrival in Canada be can be sent back to his native country, and because of " the marvellous results obtained of late years from the treatment with hypodermic injections of ethyl esters of chaulmoogra oil."

L. R.

HOFFMAN (Frederick L.). **The Leprosy Situation in the United States in 1923.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 22. Vol. 83. No. 21. pp. 1707–1708.

The Federal leprosarium was opened at Carville in 1921, and by October 1st, 1924, 297 patients had been admitted. Letters addressed to every State Health Officer revealed most cases in the Southern States and California, nearly half those at Carville coming from Louisiana. Many of the States are now free, while only a few lepers are known in most of these remaining infected, the great practical value of the Federal leprosarium being already evident.

L. R.

MARTIN & DEKESTER. **Contribution à l'étude de la lèpre au Maroc et en particulier dans la région de Fès.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 204–218. With 1 fig. [12 refs.]

This further report on leprosy in Morocco shows that the disease is frequent in the country. A map shows that the cases mostly occur north of Fez, while the disease is believed to date back to the time of the Phoenicians. Notes of seven cases treated with eparseno are considered not to allow of any general conclusions regarding its value, but they show that the high doses advised by J. HASSON may be dangerous. The establishment of leprosaria on the lines of agricultural colonies with a hospital, and not as prisons, is advised.

L. R.

MORISSEAU. **Considérations sur l'étiologie de la lèpre au Soudan.**—*Rev. Méd. et Hyg. Trop.* 1924. May–July. Vol. 16. No. 5. pp. 129–133.

The writer confirms ROGERS' observations on the influence of climate on the incidence of leprosy, the regions of the Soudan with a short rainy season and a dry climate showing few lepers, while there are many lepers further South in the hot humid climate of the Boho-

Bouques area. Here, too, since the inhabitants wear few clothes and have no ideas of hygiene, and flies are very abundant, infections are more numerous. The people also eat earth, possibly contaminated by flies, which the author thinks more easily spread the lepra bacillus than mosquitoes. He considers that infection is more likely to take place through the alimentary canal than through the skin, but produces no evidence in favour of that theory and admits that it is not proved.

L. R.

MORGAN (F. G.). **Report on the Investigation of a Number of Cases of Leprosy at Nauru, Central Pacific.**—*Commonwealth of Australia Dept. of Health Service Publication.* No. 25. 24 pp. With 1 chart in text.

This is an interesting report on a careful investigation of a recent outbreak of leprosy in a small island under the complete control of a Company, where 39 cases have been discovered since 1920, all but two among the local inhabitants, probably originating from a Gilbert Island woman between 1911 and 1914, and spreading from three main centres of infection. Routine nasal swabbing proved of no value in detecting early cases, only two cases, both advanced, out of 29 being positive, but smears from excised suspicious lesions gave positive results, although not infallible. Early macules most frequently appeared on the upper arms, and in maculo-anaesthetic cases a piece of tissue excised without pain from the centre of a patch enabled bacilli to be found in 7 out of 17 such cases. The cases have been all isolated and are being treated efficiently, and new cases are being watched for, so the further progress of this outbreak will be of great interest.

L. R.

DE ALBUQUERQUE (Oswaldo Cavalcanti). **Formas clinicas e symptomatologia da Lepra.**—*Rev. Med.-Cirurg. de Brasil.* 1924. July. Vol. 32. No. 7. pp. 364–371.

The author presents in this paper a brief résumé of the symptomatology of leprosy. He mentions first the site of entrance of the bacillus and the variable incubation period, and then passes on to describe "cutaneous leprosy," dividing the disease into four periods: (1) That of the development of the maculae which may be hyperchromic, hyperaemic or achromic. During this there are various trophic and sensory symptoms; (2) the nodular period, which merges into (3) the period of evolution of the nodules; (4) progress and termination, death resulting in many cases from intercurrent disease.

The nervous form is divided into a period of invasion, followed by that of eruption which may resemble one or other of those of cutaneous leprosy, but is often pemphigoid. This is succeeded by a "neuritic" period which passes into the degenerative phase with consequent anaesthesia, amyotrophy and mutilation.

H. Harold Scott.

i. Hudelo & Pierrot. **Gomme du dos du nez à bacilles de Hansen au cours d'une lèpre tuberculeuse.**—*Bull. Soc. Française Dermat. et de Syph.* 1924. July. No. 7. pp. 355–356.

ii. Dore (S. E.). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.) 1924. Dec. Vol. 18. No. 2. pp. 16–17.

iii. Brayton (Nelson D.). **Leprosy, with Report of a Case in Arizona.**—*Southwestern Med.* 1924. Oct. Vol. 8. No. 10. pp. 480–483. With 1 fig.

iv. Holderman (H. H.). **Leprosy: Report of a Sporadic Case developing in Pennsylvania.**—*Jl. Amer. Med. Assoc.* 1924. June 14. Vol. 82. No. 24. pp. 1927–1928. With 2 figs. [8 refs.]

v. Barrera (F. de P.) & Chavarría (A. Peña). [**The Acute Phases in Chronic Leprosy.**]—*Rev. Méd. de Bogota.* 1924. Vol. 42. p. 69. [Summarized in *Jl. Amer. Med. Assoc.* 1924. Oct. 18. Vol. 83. No. 16. p. 1281.]

i. The writers record a case of leprosy with febrile attacks, accompanied by the formation of a sort of semi-fluctuating gumma-like swelling in the nose, which on puncture yielded a sero-purulent fluid containing Hansen's bacillus.

ii. A nodular case in a boy of 14, who developed leprosy this year. His father, with whom he lived for ten years, had suffered from anaesthetic leprosy since the child was eleven months old, having been born in this country and never left it, so the child must have been infected in England.

iii. A sporadic case of nodular leprosy of an advanced stage; the patient had come from Mexico, and had returned after being deported there.

iv. An early case of nodular leprosy in a woman aged 26. She had lived for many years in Brazil before coming the United States in 1920, and presented no features of special interest. The author makes the curious statement that in Calcutta the nastin treatment is now used.

v. This paper deals with observations already noticed. (See this *Bulletin*, Vol. 21, p. 864.)

L. R.

Lara (C. B.), de Vera (B.), Samson (J. G.) & Eubanas (F. C.). **Chief Causes of Death among Lepers at the Culion Leper Colony.**—*Jl. Philippine Islands Med. Assoc.* 1924. Aug. Vol. 4. No. 8. pp. 289-306. [11 refs.]

This paper supplies much valuable information on a subject regarding which little has been recorded. Since its establishment almost eighteen years ago the colony has been a small town with the people living in their own houses under natural conditions, while during the last two years the new treatment has been carried out on a large scale with the aid of four additional physicians, and post mortems have been performed in one-third of the fatal cases; clinical records extend back to 1908. 360 recent autopsies showed the most frequent causes of death to have been Tuberculosis 24·0 per cent., Nephritis 16·3 per cent., Broncho-pneumonia 9·3 per cent., Dilatation of heart 7·6 per cent., Endocarditis 5·0 per cent., Amoebiasis 3·3 per cent., Lobar pneumonia 3·0 per cent., Gangrene 2·3 per cent., Leprosy 2·3 per cent. and other diseases in still smaller proportions. The earlier less accurate clinical records showed much higher figures for leprosy itself and for beriberi, and much lower ones for tuberculosis, organic heart disease and nephritis in particular. A great change took place in the figures with the increase in the medical staff and in the frequency of post mortems in 1922, as shown in Table 3.

TABLE 3.

INFLUENCE OF THE CHARACTER OF THE PERSONNEL ON THE MORTALITY FIGURES.

	T. B.	Nephritis.	Cardiac.	Gangrene Sept. & Col.	Leprosy.	Malaria.	Dysen.-Enter.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1921.							
Clinical figures (inadequate staff).	30·0	3·1	7·7	3·7	21·7	6·2	7·3
Autopsy on 11 cases (Dr. Wade).	63·6	6·1	—	6·3	—	—	—
1922.							
Clinical figures (increased staff).	51·4	6·7	3·6	3·6	7·1	2·8	2·8
Clinical and autopsy combined.	54·5	8·2	4·2	3·6	(None autopsied)	2·8	2·3

The tuberculosis rate is nearly double, nephritis more than double, while leprosy declined to but one-third of the 1921 rate, showing that many of the tubercular and nephritis cases were formerly not recognized, while most of the deaths attributed directly to leprosy were wrongly diagnosed. The influence of treatment from May, 1922, to December, 1923, is illustrated by the figures in Table 4.

TABLE 4.

CHIEF CAUSES OF DEATH IN TREATED AND UNTREATED GROUPS OF PATIENTS, MAY, 1922, TO DECEMBER, 1923.

Group.	Total Deaths.	Tuberculosis.		Nephritis.		Heart Disease.		Pneumonia.		Gangrene Sept. Inf.		Dysent. or Enter.		Leprosy.		Cerebral Hemor.		Malaria.		Other Dis.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Treated ..	282	91	32·2	74	26·2	28	9·9	19	6·7	9	3·1	9	3·1	7	2·4	6	2·1	6	2·1	32	11·3
Untreated ..	415	309	74·4	41	9·8	26	6·2	9	2·1	4	0·9	2	0·4	11	2·6	7	1·6	1	0·2	5	1·2

NOTE.—Patients who received treatment for only a short time were not included in this table.

The high rate from tuberculosis in the untreated is due to that class containing a much greater proportion of tubercular patients, who do not stand the treatment well. Nephritis, on the other hand, gave almost three times as high a proportion in the treated class, in spite of more early cases being included among them; indicating that the prolonged use of the ethyl ester chaulmoogrates damages the kidneys in some cases. Deaths from organic heart disease, chiefly due to acute dilatation, were also slightly more common among the treated, as well as from acute concurrent affections, which is, however, attributed to the patients being stronger and engaging in activities exposing them to infections. Deaths from leprosy were about equal in the two groups, no decrease among the treated being evident, owing to the treatment occasionally exciting an acute exacerbation of the disease ending fatally or to repeated reactions leading to debility and emaciation; there is evidence to show that tuberculosis-complicated cases died sooner under the treatment, which is not now given in such cases, the tubercule death rate having since fallen slightly in 1923. The increase of nephritis deaths from 8·2 per cent. in 1922 to 18·4 per cent. in 1923 is undoubtedly due to the treatment, while in some it ended in acute dilatation of the heart. The nephritis occurred most in early cases, and tuberculosis in late nerve cases. Death from leprosy itself increases up to the 15th year of the disease, and then decreases owing to the tendency to arrest.

L. R.

KOBAYASHI (Wasaburo). **[On a New Method of Detection of *Lepra Bacillus* in Testicular Tissues, and on Early Diagnosis of Leprosy.]**—*Hifuka Kiyo.* (*Arch. of Dermat*). 1924. Jan. Vol. 2. No. 3. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 269–270.

"The author examined the puncture fluid of the testes in numerous cases of leprosy and could demonstrate the bacillus from the fluid even from cases having no outward changes in the testes, even if the bacteriological examination of other materials should prove negative. He extols the necessity of the puncture examination of the testes for the early diagnosis of leprosy." The summary does not state if the method was popular with the patients.

L. R.

HASSELTINE (H. E.) & GORMAN (P. J.). **A Comparative Study of the Schultze-Tigges and the Ziehl-Neelsen Methods of Staining** *B. leprae.*—*Public Health Rep.* 1924. Oct. 24. Vol. 39. No. 43. pp. 2683–2685. [1 ref.]

The writers have tested the new method described by SCHULTZE-TIGGES in duplicate slides to those stained by Ziehl-Neelsen from 100 lepers, snips of skin and nasal scrapings being taken for the purpose, and find the older method slightly more efficient; it is also easier for the microscopist's eye than the yellowish pink background of the new method.

L. R.

NICOLAU (S.) & BANCIU (A.). **Sur une particu [illegible] rentielle de la réaction de Bordet-Wassermann dans [illegible] et la lèpre.**—*C. R. Soc. Biol.* 1924. Dec. 19. [illegible]. No. 36. pp. 1352–1354.

The writers' experience with the Wassermann test agrees with that of others. They obtained positive results in 22 out of 27 lepers, but on using the method of progressive dilutions with physiological salt solution in cases of leprosy and syphilis giving positive reactions they found that the titre of the reaction in lepers greatly surpassed those of syphilis. In syphilis the fixative power of the serum was lost at from the fortieth to the fiftieth dilution, while in 18 cases of leprosy it ranged from 1 in 70 to 1 in 280 dilutions, obtained by mixing 0·1cc. of leprous serum with 1–5, 1–10, 1–20, etc., of salt solution and using 0·1 cc. of the freshly made mixture for the test. In only four cases was fixation not obtained below 1–20 or 1–30 dilutions, all mixed cases, two of which were predominantly nerve cases. They have found this method of great value in the diagnosis of leprosy including incipient cases.

L. R.

SCHÖBL (Otto) & BASACA (M.). **Contribution to the Serology of Leprosy.**—*Philippine Jl. Sci.* 1924. July. Vol. 25. No. 1. pp. 1–9. [2 refs.]

The authors have tested the globulin precipitin test by the following simple method. Blood is taken from a vein and the serum allowed to separate in a test tube wetted with normal saline; 0·2 cc. of serum is placed in each of a series of small tubes, to each of which 0·6 cc. of distilled water is added carefully to avoid its mixing with the serum with Wright's pipettes, one tube remaining undisturbed and the other mixed thoroughly by shaking, the tests being performed not more than five hours after taking the serum. A preliminary reading was made after standing at room temperature (average 27° to 28°C.) and again the next morning after placing in a refrigerator; a distinct contact ring, or a diffuse cloudiness in the mixed tube and a sediment in each at the final reading, most marked in the mixed tube, indicated a positive reading. Tables are given of the results in a selected series of cases, which indicate that all forms of leprosy, treated and untreated, early and advanced cutaneous cases, bacteriologically negative nerve and presumably cured cases, gave positive results, although less pronounced in the cured than in the active cases; while the control healthy sera were all negative. On the other hand, the Wassermann test was only positive in 35 per cent. of the cases. To establish a standard strength for the reaction the sera were diluted 1 : 1, 1 : 2, 1 : 3, 1 : 4 and 1 : 5 in both lepers and non-lepers, and no positive reactions were found in non-lepers with dilutions of 1 : 3 or less, but they might occur in dilutions of 1 : 4, the cured cases giving less marked reactions than active ones. The reaction is promoted by a low temperature and does not always occur at a high one. The reaction in leprosy is considered to be due to "an upset balance between the salts and globulin, possibly euglobulin."

L. R.

Leão (Antonio Eugenio de Arêa). [In Portuguese and English.] **As reacções de Wassermann e de Sachs-Georgi na lepra. The Wassermann and Sachs-Georgi Tests in Leprosy.**—*Mem. Inst. Oswaldo Cruz.* 1923. Vol. 16. No. 1. In Portuguese pp. 47–57. In English pp. 59–69.

The author refers to previous literature, and then records his own experience, which cannot be better summarized than in his own conclusions :

" 1. In leprosy, the Wassermann test is frequently positive. In 50 per cent of cases with antigens of luetic liver (from foetus with hereditary syphilis), of cholesterinised human heart and of cholesterinised ox-heart ; in 32 per cent. of cases with the antigens of acetone-insoluble lipoids (Noguchi or Bordet processes) and in 14 per cent. of cases with Lesser's antigen (ethereal extract of organ).

" 2. The degree of fixation varies greatly according to the antigens employed. It is, however, the antigens prepared with liver of foetus with hereditary syphilis and those with cholesterinised ox-heart that give the greatest fixation.

" 3. The greatest number of positive Wassermann reactions is given by the macular (87·5 per cent.) and tubercular (65·2 per cent.) forms of leprosy. The nervous form of the disease furnished 17·7 per cent. of positive reactions.

" 4. The cause of complement fixation by leprous serum when mixed with a syphilitic antigen is certainly to be explained by the poly-fixing properties of the serum.

" 5. The Sachs-Georgi test in leprosy gives a total percentage of 36 per cent. positive reactions.

" 6. The greatest percentage of Sachs-Georgi positive reactions is given by the macular form of the disease (62·5 per cent.), the next greatest by the tubercular form (39·2 per cent.). The nervous form gives a percentage of 17·7 per cent. positive Sachs-Georgi reactions."

L. R.

Muchow (Hermann) & Levy (D. M.). **Een sero-diagnostische leprareactie.** [A Sero-Reaction of Diagnostic Value in Leprosy.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Nov. 15. Vol. 68. 2nd Half. No. 20. pp. 2461–2464.

The following extract was prepared : A leprous nodule was triturated with a mixture of equal parts of alcohol 96 per cent. and of physiological salt solution, the quantity used being equal to five times the triturated mass of tissue. The whole was left at room temperature for eight days. Then it was filtered and inactivated at 56°C. for half an hour. Of this extract 0·2 cc. was mixed with 0·5 cc. of a 10 per cent. solution of NaCl and 0·2 cc. of the serum of a leper (4 cases) or a man not suffering from this disease (4 cases). After shaking thoroughly, the mixture is centrifuged. The reaction is considered to be positive if the test-tube, when shaken, shows flakes floating in the fluid. It was strongly positive in all of the four cases of lepra, completely negative in the others. The serum of 33 patients suffering from other disease (among which there were 18 suffering from various dermal diseases) was tested in the same way, with a negative result. If the extraction of the leprous tissue was performed with alcohol 96 per cent. alone, the reaction proved negative ; with equal parts of alcohol 96 per cent. and ether or with physiological salt solution alone the specificity was lost, the non-leprous sera sometimes showing a slight positive reaction.

N. H. Swellengrebel.

MARIANI (Giuseppe). **Osservazioni sopra una forma speciale di allergia cutanea nella lebbra (lepra tubercoloide sperimentale nell'uomo).** [A Special Form of Cutaneous Anaphylaxis in Leprosy.]—*Pathologica.* 1924. Sept. 15. Vol. 16. No. 380. pp. 471–477.

The author excised a recently developing leprous nodule, rich in bacilli, but still covered with intact skin, and emulsified it. Part of the emulsion was injected subcutaneously and intraperitoneally into guineapigs and white mice. An inflammatory reaction ensued with disintegration of the bacilli, but no nodules developed. The remainder of the emulsion was used for the intradermal reaction in 10 lepers, 8 of the nodular or mixed form and 2 of the purely nervous. In the former there was erythema with itching and a sense of heat, followed in 3–6 days by a faintly visible infiltration. There was no febrile reaction nor any glandular enlargement. The whole disappeared in 8–12 days. Repeated examinations showed that the bacilli rapidly disappeared and in 3 days there were merely a few scattered granular organisms seen.

In patients suffering from the nervous form there was a very slight local reaction with itching in 4–8 days, no rise of temperature. After 10 days there was some infiltration, and local swelling developed slowly with the formation of a central vesicle by the 20th day which attained the size of an orange pip, and was surrounded by a reddish, dense border. The lesion reached its maximum development in 30 days and remained thus for the next 10 days, after which it gradually receded, finally clearing up, with some central loss of tissue, in about 60 days. There were no constitutional symptoms nor any enlargement of glands. The bacilli which were abundant in the inoculated emulsion showed similar disintegration as with the nodular type of cases. The reaction in the nervous form was more of a granuloma-like nature than in the nodular. The remainder of the paper is devoted to an account of the histological changes produced. The reverse of the above experiments, namely, inoculation of tissue from a nerve-leprosy patient into one with the nodular form has not yet been carried out.

H. Harold Scott.

READ (Bernard E.). **The Toxicity of Chaulmoogra Oil (Oleum Hydnocarpi).**—*Jl. Pharm. & Experim. Therap.* 1924. Oct. Vol. 24. No. 3. pp. 221–257. [39 refs.]

This is a valuable paper on the little investigated subject of the toxicity of chaulmoogra oil when administered in large doses to animals either orally or by injections of the oil itself or of the ethyl hydnocarpate made from it, rabbits being chiefly used in the experiments. The author concludes.

"1. The toxic affect of chaulmoogra oil is first manifest in producing anorexia, nausea and emesis.

"2. The character of the emetic effect is probably both that of a local irritant and that of a central excitant. The central action is most pronounced and is produced irrespective of the path of administration of the drug.

"3. There is evidence of a cumulative central effect, which after a succession of therapeutic doses may produce emesis and anorexia.

"4. The emetic and other toxic effects of chaulmoogra are apparent after the administration of ethyl hydnocarpate. On account of its solubility, hydnocarpic acid, as the glyceride or the ethyl ester or as a salt, is probably the most active constituent of chaulmoogra preparations.

"5. Toxic doses of the hydnocarpates show hemolysis of blood cells, renal irritation with hemoglobinuria, and fatty infiltration of the liver. When injected subcutaneously and intravenously there is local irritation, often leading to necrosis of tissue.

"6. Ethyl hydnocarpate injected intravenously into a dog produces a marked increase in the lymph flow.

"7. The M.L.D. of chaulmoogra oil to rabbits by mouth is 5 cc. per kilogram of body weight. Ethyl hydnocarpate by intravenous injection produces death after 0·5 cc. per kilogram of body weight.

"8. Fatal doses of chaulmoogra oil given to rabbits produces a hypersensitivity with lowered blood calcium and inco-ordinated movement, followed by a period of convulsive retching of a strychnine-like character. Death results from respiratory failure.

"The local pulmonary effect is considered to be less important than that active centrally, which produces excitement with subsequent paralysis associated with deafness and blindness, and loss of control of the motor nerves.

"9. There often occurs a rise in temperature following the intravenous injection of ethyl hydnocarpate. A fatal outcome is preceded by a fall in temperature.

"10. Administration of therapeutic doses of the hydnocarpates to dogs assists the well-being of the animal as demonstrated by the general appearance and by increase in weight; but when given to rabbits maintained on a plain oat diet it has an intense toxic effect. There is produced anorexia, albuminuria, loss of body weight, and eventually death."

L. R.

ROUILLARD (J.). **Chaulmoogrates et morrhuates de soude : leur emploi dans le traitement de la lèpre et de la tuberculose.**—*Presse Méd.* 1924. Nov. 22. Vol. 32. No. 94. pp. 929–931. [6 refs.]

A long abstract of the Croonian Lectures of 1924. [*See above*, p. 208.]

L. R.

MUIR (E.) assisted by DE (N. K.), LANDEMAN (E.), ROY (T. N.) & SANTRA (I.). **The Preparation of Hydnocarpus Esters and their Use in Leprosy.**—*Indian. Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 221–233. With 1 text fig. & 3 plates.

The authors point out that *Taraktogenos kurzii*, from which true chaulmoogra oil is obtained, grows in rather inaccessible places in Burma and North East India, and its fruit ripens and falls during the rainy season, when the forests are practically inaccessible, so the fruit is not obtained fresh; but *Hydnocarpus wightiana*, with which they deal in this paper, grows freely in a wild or cultivated state in South and West India, and its oil, which is at least equally effective in leprosy, is easily and cheaply obtained in unadulterated form, while on cultivation it fruits abundantly and at all seasons of the year after 6 or 7 years' growth, and is readily grown from fresh seed. In Calcutta the esters are now prepared solely from this oil, and can be made cheaply and simply by either of the following processes :—

" 1. *Hot process.*—425 grammes of crude, cold drawn hydnocarpus oil, 552 cc. of 96 per cent. ethyl alcohol, and 31·87 cc. of sulphuric acid (sp. gr. 1·845) are placed in a 2½ litre flask fitted with a reflux condenser, the alcohol and oil being mixed before adding the acid. The contents of the flask are allowed to boil vigorously on a water bath for four hours without intermission. Under the influence of the mineral acid catalyst, the glycerol radicle in the glyceride of the oil changes place with the ethyl group in the alcohol, forming the ethyl ester and glycerol. The reaction product is then transferred to a separating funnel and washed with an equal volume of water twice over, and then with a 0·2 per cent. solution of sodium carbonate in water which forms a thick emulsion ; after half an hour crystals of common salt are gradually added in small quantities and brought in contact with the emulsion by slowly rotating the vessels so as to break the emulsion. As this takes place the water forming in the lower layer is gradually removed and the upper layer consisting of esters is filtered through thick filter paper. The esters, though now clear, still contain a certain amount of fine emulsion which makes them dark in colour. This may be removed rapidly by drying in a steam oven for two hours or by leaving at room temperature for 5 or 6 days, when the fine emulsion will sink to the bottom, whence it may be removed. The esters are then filtered again and the process is complete.

" 2. *Cold process.*—This takes a considerably longer time than the hot but it has the advantages that no special apparatus is required, labour is less, and any therapeutic value which would be destroyed by boiling is preserved. The oil, alcohol and acid are mixed in the same proportions as in the hot process in a 4 lb. bottle with a tightly fitting glass stopper and left until the process of esterification is complete. The bottle should be shaken once or twice a day to mix up the upper and lower layers. This hastens the process, as does also the placing of the bottle in the sun or in some warm place. Neither the shaking nor the heat is, however, essential if time is not a consideration. To begin with, the oil forms a lower and the alcohol and acid an upper layer. As esterification proceeds a point is reached at which the lower layer, now chiefly composed of esters, gains a less specific gravity than the upper layer, which now contains a large proportion of glycerol, and therefore rises to the top. To ensure the completion of the esterification it is well to allow the process to continue further for half the time which elapsed between the mixing of the ingredients and the rising of the lower layer. Thus, if the lower layer takes 14 days to rise, the ingredients should be left in the bottle for 7 days longer. The lower layer is then drawn off and the upper layer, consisting of esters, washed according to the method mentioned under the 'Hot Process.' The esters may be washed in the same bottle in which they have been prepared by substituting for the glass stopper a cork stopper perforated with two glass tubes, the one two inches in length inserted flush with the inner end of the cork and fitted with a piece of rubber tubing compressed with a spring clamp, and the other reaching from the cork to the bottom of the bottle. By inverting the bottle the esters rise to the top and the lower layer may be drained off by opening the spring clamp. Or the lower layer may be syphoned off through the long glass tube without inverting the bottle.

" The weight of the esters recovered is almost equal to the weight of oil used."

If *Hydnocarpus wightiana* is grown in all leprous countries, as it should be, every leper institute could easily make its own esters by one of the above methods at very little cost. They may be bottled or put up in ampoules and sterilized at 120°C. for half an hour, while the pain and local reaction on injection can be very much reduced by adding an equal quantity of olive oil before sterilization ; 3 per cent. iodine added to the esters will kill even anthrax spores in three days, and 1 per cent. iodine will safely sterilize the esters without the aid of heat, and they may then be kept in glass-stoppered bottles for use on a large scale. Only three unimportant abscesses have occurred in many thousands of injections. The dose of equal parts of the ester and olive oil ranges from 0·5 to 10 cc. intramuscularly or subcutaneously, best into the soft parts of the gluteal muscle with the patient sitting down, or subcutaneous injections may be given beneath the lesions on the extensor surfaces of the limbs, the needle being inserted in several directions through two punctures at opposite edges of the lesions to distribute the dose and hasten its absorption; up to 4 cc. may be given in this manner and any excess into the gluteal region. Intravenous injections have practically been given up on account of coughing and pain in the chest sometimes following them. The initial dose of 0·5 cc. may be increased by 0·5 cc. at each bi-weekly dose up to the highest tolerated dose without raising the temperature to 100°F. for 24 hours or producing a local inflammatory reaction in the lesions. The addition of either creosote, or probably better thymol in the proportion of 8 grammes to 50 cc. each of undistilled hydnocarpus esters and olive oil, enhances the action, although thymol alone is inferior.

The treatment should be continued until all lesions have disappeared, except permanent nerve ones, and repeated negative bacteriological examinations have been made. Where failures have been reported either the treatment has not been carried out thoroughly and persistently with attention to diet, hygiene, etc., or unsuitable cases, with permanent lesions (due to nerve or tissue destruction) have been chosen. Early cases naturally give the best results, so early diagnosis is essential.

To clear up the question of the value of different oils, esters of hydnocarpus with a closed carbon ring, and the highest specific rotation, and linseed oil with highest iodine value and amount of unsaturated fatty acids, were tried, and the former gave 6 per cent. cleared up completely and 54 per cent. much improved, against 1 per cent. and 49 per cent. with linseed esters; while coconut esters, with the lowest proportion of unsaturated fatty acids, were less effective than linseed ones, so that both the closed carbon ring and the amount of unsaturated fatty acids appear to be factors of value. Illustrations of chaulmoogra and hydnocarpus seeds, as well as of the *Hydnocarpus wightiana* tree, are given, one of two years old being six feet in height. This paper contains many other points of minor practical interest and should be read in full by all who have to treat leprosy.

L. R.

WILSON (R. M.). **Chaulmoogra Oil and Ethyl Esters in Treatment of Leprosy.**—*China Med. Jl.* 1924. Sept. Vol. 38. No. 9. pp. 743–745. With 1 fig.

This paper opens with the cheering sight of a photograph of 59 lepers, who have been discharged as apparently cured after treatment with chaulmoogra oil, while on May 1st, 1924, 75 patients were discharged apparently cured and 40 more are expected to be ready for discharge in a few months. All these have been treated in Korea by injections of the oil, given by themselves, which in Dr. Wilson's experienced hands has yielded better results than the ethyl esters obtained from the Peking Union Medical College and from Dr. SHIGA of Seoul Hospital; after two years' use, with an average treatment of six months, the lepers refused to continue the esters, as they complained of dryness of the skin, eye troubles, including disturbance of vision, general weakness and loss of strength, headache, muscular pain, or failure to improve.

The treatment now used successfully consists of weekly subcutaneous injections of 3–8 cc. of sterile chaulmoogra oil [species not mentioned, but *Hydnocarpus anthelmintica* is the common Chinese variety] to which 1 per cent. of camphor has been added, only slight pain resulting from the shallow injections into the muscles now given. During the past year 575 cases on the average were under treatment, half on injections and half on oil orally. After two or three years' injections the patients are so far restored to health that they continue on oil orally. Baths twice a week, regular work and good hygiene are equally important, and marked improvement is observable in three to six months' treatment. Complications are treated and infectious cases isolated, but those with tuberculosis improve but little.

L. R.

HEINEMANN (H.). **Ueber Behandlung der Lepra mit Thymol.** [Treatment of Leprosy with Thymol.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 523–525. [3 refs.]

The writer claims to have improved on HAMZAH's method of treating leprosy by intramuscular injections of 10 per cent. thymol in codliver oil [this *Bulletin*, Vol. 21, p. 182], by using intravenous injections of 651a, a thymol emulsion prepared by VON HEYDEN, and used by KRUTZSCH in tuberculosis. The first dose for adults is 0·2 cc., increased by 0·2 cc. at each injection up to a maximum of 0·8 cc., which can be continued every fourth day for months without harm, only slight cough being produced. He has treated 70 cases of leprosy, and given over 1,000 injections, and reports striking improvement in a relatively short time, although it is too early to say if cures can be obtained. As is so usual with German work, the exact composition of the new preparation is not published in this paper.

L. R.

TOURNIER (E.). **De l'emploi du kermès dans le traitement de la lèpre.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 761–765. [5 refs.]

Favourable reports of the use of antimony salts in tropical diseases, including leprosy, led him to look for a less toxic preparation than tartar emetic, and to treat two cases of leprosy with kermes (Stibium sulfuratum rubrum) alone, and two in conjunction with atoxyl and novarsenobenzol with favourable results, especially in the nodular and mixed cases. In adults daily oral doses of 0·50 to 0·60 cgm. in water are given without nausea or albuminuria and can be continued for nearly two months, while it is not depressing, and its use can be combined with ethyl chaulmoogrates or other treatment. In the nodular cases marked improvement, accompanied by breaking up of the bacilli into granules, was noted within a month or two, while the pains of the nerve form are also alleviated greatly. The method is so simple and easily carried out that it is worthy of a more extended trial, no cure having yet been obtained with it.

L. R.

WALKER (Norman). **A Case of Leprosy. Treated by a Vaccine prepared from a Nodule from the Patient's Arm. With a Note on the Preparation of the Leprosy Vaccine by** LISTON (Glen), **and a Note on the Histology of the Case by** DAWSON (J. W.).—*Lancet.* 1924. Sept. 13. pp. 542–543. With 1 coloured plate & 1 text fig.

An advanced nodular case of leprosy, in which after a few injections of chaulmoograte of sodium this treatment was abandoned on account of the pain produced. As the author had found a vaccine prepared from tuberculous glands of value in lupus, he got Lt.-Colonel Glen LISTON, I.M.S., to make a sterile emulsion in normal saline of a removed nodule after grinding it in a mortar with sand; the emulsion was heated to 60°C. for half an hour, diluted with carbol saline to contain roughly 200 million lepra bacilli per cc., and put up in ampoules. The first dose of 0·1 cc. was gradually increased to 1 cc. without any severe reactions. Improvement began within three weeks, and after two months was very marked, the large nodules on the arms having nearly disappeared in that time, as shown in a coloured plate, while the general condition had also improved, the result so far being apparently greater than in previously recorded cases of this method of treatment. Sections of nodules before and after treatment showed a great diminution of the rod-shaped bacilli with disintegration of many of them into acid-fast dots, together with some fibrosis of the tissues.

L. R.

GOODHUE (William J.) & HASSELTINE (H. E.). **Report of Reexamination of a Child in whom Leprosy developed at Nineteen Months of Age.**—*Public Health Rep.* 1924. Oct. 24. Vol. 39. No. 43. pp. 2680–2683.

This child of leper parents, at the Molokai settlement of Hawaii, developed leucodermic patches on the right cheek and on the back of the thighs (without anaesthesia) of doubtful nature, and a reddish-brown slightly-raised nodule, in sections of which acid-fast bacilli were found, the leucodermic patches and nasal smears being negative. The child had been removed from leprous surroundings within six hours of birth, as is now the custom of the colony, and had not since been in contact with lepers, and appears to have been the first child so removed to have developed leprosy among about 100 born in the settlement since their early isolation has been carried out. Four months after the excision of the nodules there was no evidence of the progress of the disease and the scar was free from acid-fast bacilli, this being in October, 1915; the child was kept separate from the other healthy children. In May, 1916, a few atypical acid-fast bacilli were found in the scar of the excised nodule, and the child was declared a leper and returned to her parents in the colony, although the writers now think that further observation would have resulted in negative findings.

On January 8th, 1923, the child, now 10 years of age, was re-examined, and only showed some old standing leucodermic patches with normal sensation, and the scar at the site of the former nodule was negative bacteriologically, as were nasal smears. On June 21st, 1924, negative findings were again obtained, and there is now no evidence of her being a leper, although she had received no anti-leprous treatment other than the excision of the nodule, and she is considered to be free from the disease. The writers add: " This belief is strengthened by the results more recently obtained by us by the surgical removal of nodules in other patients who have a few nodules which are small and well defined." [This is a most important observation, especially in view of the numerous cases now coming forward in the earliest stages of leprosy, and it supports MUIR's contention that many of the first noticed lesions are the site of primary infection through the skin, for which early excision is now clearly indicated. If the value of this measure is confirmed by further experience it will be still easier to attract the early cases for treatment, with ultimately more rapid diminution of the incidence of the disease.]

L. R.

RHO (Filippo). **Cupric and Cyanocupric Preparations in the Therapy of Tuberculosis and Leprosy.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp. 315–320. [32 refs.]

Professor Rho of Italy, after giving the history of the ancient use of copper compounds in tuberculosis, and the recent use of cyanocupric compounds by KOGA and his followers in Japan in both tuberculosis and leprosy, narrates his own work on the subject in Italy, where Professor SERONO made a series of such salts, since the Japanese workers, in accordance with the practice of their German teachers, have not revealed the precise nature or mode of preparation of the compounds they used. A stable soluble compound named Cuprocyan, consisting of a double cyanide of copper and potassium, containing 22·26 per cent. of copper, and having the form of white clinorhomboidal crystals, very soluble in both water and alcohol, was made; a 2 per cent. solution is sold in 2 cc. ampoules, containing 4 mgm. of cuprocyan, one of which may be injected every other day hypodermically or intramuscularly with little pain. For slow intravenous injection every five to seven days 10 cc. phials are also supplied, the first dose being 5 cc., followed by 7½ and then 10 cc. doses, and either form of treatment may be continued for many months with occasional intervals. Another preparation, called cuproiodase, is a lipoid compound of copper, iodine and cholesterin, used for local applications in surgical tuberculosis and to destroy the lesions of leprosy.

In pulmonary tuberculosis good results are claimed in first and second stage cases, but not in the third stage, while the cuprocyan is reported to lead to the formation of fibrous tissue around the lesions. In leprosy 20 cases treated in Sicily and Sardinia by cuprocyan intravenously gave improvement after 10 injections in almost all the patients, while cuproiodase locally produced healing of local ulcers except perforating ones. Microscopically nodules were found to become fibrosed and the bacilli became fewer and broke up into granules with marked benefit, although the author cautiously adds that in such a chronic disease "it is quite impossible to think of putting a definite stop to the relapsing manifestations of the malady, unless with a very long treatment, even of many years." It is suggested that this method of treatment might be used with advantage in addition to the chaulmoogra oil preparations.

L. R.

i. SCHÖBL (Otto) & KUSAMA (Hiroshi). **Chemotherapeutic Experiments with Chaulmoogra and Allied Preparations. III. The Disinfecting Power of the Vapors of Vegetable Oils toward Acid-Fast Bacteria.**—*Philippine Jl. Sci.* 1924. Apr. Vol. 24. No. 4. pp. 443–445.

ii. ——. **IV. A Survey of Certain Organic Compounds as to their Growth-Inhibiting Activity toward Acid-Fast Bacilli in Vitro.**—*Ibid.* Aug. Vol. 25. No. 2. pp. 123–134. [2 refs.]

iii. ——. **V. An Inquiry into the Mechanism and Nature of the Growth-Inhibiting Effect of Chaulmoogra and other Vegetable Oils.**—*Ibid.* pp. 135–150. [13 refs.]

i. These experiments were carried out by exposing the surface of glycerine-meat-infusion-agar slants, recently inoculated with a vigorous strain of human tubercle bacilli, to any vapours given off by about 0·1 cc. of the substances tested placed on the inner end of the cotton plug, which was quickly reinserted into the tube and sealed with liquid paraffin ; freshly inoculated cultures of staphylococcus, cholera vibrio and dysentery and coli bacilli also being tested. The vapours of chaulmoogra and hydnocarpus oils showed no disinfecting action on the acid-fast bacilli, but many essential oils, including bergamot, cinnamon, caryophyllum, eucalyptol, Pinus sylvestris and turpentine, completely inhibited the growth of one loopfull of viable tubercle bacilli incubated at 37°C. under these conditions.

ii. This is a highly technical paper on further tests of the growth-inhibiting activity on cultures of tubercle bacilli of various organic compounds, by adding them in solution or mixture to culture media, as in former series, with the following results :—

" 1. Water-soluble compounds showed an antiseptic effect, whereas the fat solvents such as benzol, toluol, xylol, carbon trichloride, and carbon tetrachloride which have a strong hypnotic effect were found to be only slightly antiseptic or not at all.

" 2. Sodium, copper, and nickel salts of fatty acids were found about equally effective, whereas zinc, strontium, lead and uranium salts showed no effect.

" 3. The double-bond-containing compounds all showed antiseptic effect, the double bond being more effective on the side chain than on the ring in aromatic compounds.

" 4. Unsaturated alcohols showed an antiseptic effect, particularly when containing the phenyl group which proved to be the most powerful toxic group.

" 5. High alcohols approaching waxes showed no effect. Secondary alcohols were equally or less effective than primary alcohols.

" 6. Hydroxy compounds are highly antiseptic toward acid-fast organisms, as they are toward other bacteria.

" 7. The antiseptic effect of phenols increases with the number of hydroxyl groups, the position of these groups being of importance, as the ortho-compounds are more antiseptic than the para or meta compounds.

" 8. Alkylation on the ring increases the antiseptic effect of phenols, whereas alkylation on the OH group of polyhydroxy-phenols has no noteworthy effect, provided at least one hydroxyl is preserved free.

" 9. The animo group (NH_2) has a reverse effect on the antiseptic power of the aromatic compounds, inasmuch as it has no effect when located on the ring but is strongly antiseptic when linked to the ring directly on the side chain. It acts as a haptophore group, and the strong effect of benzylamine is no doubt due to the function of the phenyl group.

" 10. Open-chain terpenes are more effective than their cyclic isomers.

" 11. In the cyclic hydrocarbons the double bond in the ring seems to be of importance in the presence of other groups on the ring, but not in itself."

iii. This paper discusses the way in which chaulmoogra and other oils act against acid-fast bacilli in the light of the extensive experiments of the author, from which he comes to the following interesting conclusions:—

" 1. The degree of unsaturation of vegetable oils which stimulate the growth of acid-fast bacteria and of those which inhibit the growth of acid-fact bacteria has no relation to their growth-stimulating or growth-inhibiting activity.

" 2. The growth-stimulating effect of certain vegetable oils is due to the glyceryl and not to the acid part of the oil.

" 3. The condition of unsaturation of the oils containing the acids from the chaulmoogra series and of the oils which stimulate the growth of acid-fast bacteria is paramount.

" 4. Saturated chaulmoogra oil lacks the growth-inhibiting activity toward acid-fast bacteria which is possessed by the unsaturated oil.

" 5. The growth-inhibiting activity of chaulmoogra oil depends on the structure of the ring of the fatty acids. When the structure of the ring is changed by saturation with hydrogen the oil loses this biologic property.

" 6. There are indications that, due to physical properties, acids from the chaulmoogric series containing a short side chain are more effective in vitro than are those having a long side chain.

" 7. Acid-fast bacteria adapt themselves to the acids from the chaulmoogric series in due time and then withstand larger doses than they did originally."

The adaptation of the acid-fast bacilli to the action of the chaulmoogra fatty acids explains the frequency with which patients cease to improve after a long course of the treatment with ethyl chaulmoogrates, and indicates a change in such cases to preparations from other oils or other drugs of benefit in leprosy.

L. R.

Araujo (H. C. de Souza). **A prophylaxia da lepra no Pará.**—*Rev. Med.-Cirurg. do Brazil.* 1924. Aug. Vol. 32. No. 8. pp. 393–402.
[See this *Bulletin*, Vol. 21, pp. 861, 864.]

Rogers (Leonard). **Recent Leprosy Research and its Bearing on the Tuberculosis Problem.**—*Glasgow Med. Jl.* 1924. Mar. Year 101. New Series. Vol. 19. No. 3. pp. 109–115. [15 refs.]

TROPICAL DERMATOLOGY.

TYAU (E. S.). **The Incidence of Skin Diseases in Shanghai.**—*Nat. Med. Jl. China.* 1924. Apr. Vol. 10. No. 2. pp. 75–79.

The numerical and seasonal incidence of 60 different skin affections based on 5,000 cases is presented in tabular form. Emphasis is laid on the high percentage of scabies, 44·14, compared with that of eczema, 22·84, and of tinea, 13·62.

W. Jenkins Oliver.

CURJEL (Dagmar F.) & ACTON (Hugh W.). **Jute Dermatitis.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 257–260. With 1 coloured plate.

This occupational dermatosis occurring in the mills, particularly in the preparation rooms where the raw jute fibre is being softened by mineral oils, is seen most frequently among the lower Hindu classes as a non-suppurative folliculitis giving rise to no subjective symptoms. Distributed mainly on the exposed parts of the arms and on the front of the legs and thighs, the lesions appear as black points and as larger follicular elevations capped with a black spicule. Histological examination shows a horny plug filling the follicle and apparently causing pressure atrophy of the hair, while the sebaceous gland is unaffected. Treatment consists in thorough washing with soap and applying a 2 per cent. resorcin lotion or salicylic acid ointment.

W. J. O.

TOYAMA. **Further Observations on Lacquer Dermatitis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 824–829. With 7 figs.

Investigations made with various forms of lacquer showed a common toxic substance " uroshiol " in Japan and China lacquers, " laccol " in the Indo-China, Tsuta-Urushi and Formosa varieties and " thitsiol " in Burma lacquer. Describing the action of uroshiol the author points out that infection may occur by the alimentary route, while the common mode of infection is via the skin. In such alimentary infections " none of the visceral organs were affected. [This fact] seems to indicate that lacquer poison possesses a specific power to combine with the cells of the skin." The degree of toxicity of the three substances is in the order (1) uroshiol ; (2) laccol ; (3) thitsiol. Concerning the toxic properties of these same substances, it is shown that this property depends upon the combined action of the presence of two hydroxyl groups and unsaturated alkyl radicle, the toxicity diminishing with the saturation of the alkyl and successive substitution of the hydroxyl radicles. " In general the toxicity of lacquer is proportional to the amount of toxic substances contained in them." Instructive plates figuring experimental cuti-reactions accompany this interesting communication.

W. J. O.

MENDELSON (W. Ralph). **Tinea Labialis (Betel-Nut Dermatitis of Lips).**—*Jl. Trop. Med. & Hyg.* 1924. Nov 1. Vol. 27. No. 21. pp. 284–285. With 3 text figs.

Brief report of 3 cases of dermatitis of the lips occurring in Siamese women who were inveterate betel-nut chewers. Cultures from the scaly lesions of the lips and from the nuts showed an apparently identical mould (not identified). Contamination had probably followed some abrasion of the lips. Rapid healing followed the application of 3–5 per cent. salicylic ointment.

W. J. O.

BLACKLOCK (B.). **Craw-Craw in Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 253–262. With 2 plates. [7 refs.]

A brief résumé of the text-book descriptions of the affection is given and mention made of its wide occurrence among the natives. The characteristic features of the disease and the distribution of the lesions in the cases observed are recorded. A parasite obtained from the central aperture of the recent papules and vesicles was indistinguishable morphologically from *Sarcoptes scabiei.* The conclusion is drawn that craw-craw of the Sierra Leone Creole is identical with scabies, and that the nematode larvae observed in some of the lesions have no etiological relationship with the disease.

W. J. O.

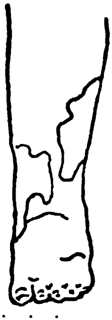
ASKINS (R. A.). **Dermatitis caused by** *Pediculoides ventricosus.* [Correspondence.]—*Brit. Med. Jl.* 1924. Nov. 22. p. 950. [2 refs.]

In this instance the mites (*Pediculoides ventricosus*) got among dockers at Bristol unloading barley from Morocco, and in some cases spread to their families in barley-dust adhering to the men's clothes. The captain and mate of the ship also were attacked, probably through the infested dust in the air.

A. Alcock.

FORNARA (A.). **Un cas de pseudomyiase rampante à Boma.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 139–140. With 1 fig.

The lesion here illustrated occurred in a native child of 1 year. It appeared near the middle of the dorsum of the foot and continued round to and across the sole and then, as here shown, upon the extensor surface of the foot and leg, as a sinuous line first of desquamation and then vesiculous. An abrupt change of direction was caused by application of nitrate of silver. No parasite could be discovered.



Case of Creeping Pseudomyiasis in an Infant of 1 year at Boma.
[Reproduced from the *Annales de la Société Belge de Médecine Tropicale.*]

A. Alcock.

BUTLER (C. S.), HOUGHTON (J. E.) & COOPER (G. F.). **Mycosis of the Hands and Feet.**—*U.S. Nav. Med. Bull.* 1924. Nov. Vol. 21. No. 5. pp. 615–630. With 13 figs. [10 refs.]

This communication is based on the answers received to a questionnaire concerning any mycotic infection addressed to 500 persons of all ranks under the observation of the U.S. Naval Medical Service, which answers are recorded in numerical tables and charts. A majority of the cases giving a history of infection of the hands and feet had served on tropical duty, the largest percentage of this group occurring among officers and the men of the Hospital Corps. Only sixteen cases of the five hundred had active lesions at the time of this investigation; these were of the vesicular, squamous, hyperkeratotic and intertriginous varieties. Emphasis is laid upon the importance of examining the roofs of vesicles for the demonstration of the fungus. The cultures so far identified were those of *Epidermophyton cruris, Microsporon audouini* and *Trichophyton asteroides.* (The general cultural and morphological characteristics of tinea fungi are very briefly described.) Complement fixation and agglutination tests were all negative. For treatment tincture of iodine, potassium permanganate solution followed by hydrogen peroxide in acid solution to remove staining, and linimentum saponis are put forward as the most beneficial medicaments for local application.

W. J. O.

MONTPELLIER (J.). **Efflorescences cutanées chez les vieux faviques. La question des "favides."**—*Bruxelles Méd.* 1924. Nov. 9. Vol. 5. No. 2. pp. 48–51. [1 ref.]

The polymorphic eruption, occurring more especially on the trunk and upper limbs, of long standing favus cases in Algeria is described. This consists of (1) small rose spots with some scaling and pustulation, which about the hair follicles become papular or spinular; (2) larger erythematosquamous macules which on resolution may leave leucodermic spots. Such cases only occasionally are observed with generallized favus cups. The scales from these lesions, prior to the fading stage, show Achorion fungus; the eruption is therefore considered to be identical with that described by other writers under the designation favus herpeticus or trichophytoide. Comparison is drawn between these favides and the trichophytides, and a partial allergic reaction in association with external infection of the fungus is suggested as the causative factor. The hope of appropriate vaccine therapy being introduced is put forward.

W. J. O.

DE VRIEZE (T. J.). **Favus in Indië.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 726–727.

Quotes an experience in which a European woman and her two children were found to be suffering from favus. The mother had been previously suffering from it in Europe. The fungus can apparently remain active and be transmitted under tropical conditions, though it is not endemic in Java.

W. J. Bais.

SOETOMO (R.). **Microsporie bij Javaansche kinderen en hare epidemiologie.** [Microsporia in Javanese Children and its Epidemiology.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 720–725. With 2 figs.

Soetomo saw three cases of microsporia in Javanese children. It is known that imported domestic animals are infected with this dermatomycosis. Infection of native domestic animals from this source may give rise to human cases, and the author emphasizes the necessity of preventive action of the veterinary service in this respect.

W. J. Bais.

CASTELLANI (Aldo). **Notes on Pruritus Ani of Mycotic Origin.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 304–305. [1 ref.]

Eleven cases of pruritus ani, out of 54 cases examined, showed the presence of a fungus; two of these had at the same time dermatitis interdigitalis pedum (mango toe), while six gave a history of having previously suffered from dhobie itch. For local treatment Deeks' ointment is recommended, viz, Ac. salicyl. 4, bismuth. subnit. 10, hyd. salicyl. 4, oil of eucalyptus 10, vaseline and lanolin q.s. to 100 parts.

W. J. O.

VILLALONGA (Jayme). **Dois casos de blastomycose cutanea.**—*Arch. Brasileiros de Med.* 1924. Sept. Vol. 14. No. 9. pp. 549–557. With 5 figs.

The first patient was a woman, 21 years of age. The condition started five years previously as a bright red papulo-squamous eruption which gradually spread from the nostrils over the upper lip; it was painless and but slightly itching. In Feb. 1923 scales were sown on Sabouraud's medium and in two months a rugose, crateriform, yellow culture was obtained. Treatment by iodine locally and iodide of sodium intravenously proving ineffectual, radio-therapy was tried with excellent results.

The second was a man of 24 years. A red spot high up on the internal aspect of the thigh extended till, in six weeks, a papular erythematous patch covered the adjacent part of the scrotum. A culture was obtained from this case also and was inoculated in the skin of the abdomen of a white rat. Ten days later the site was not healed, and the right inguinal glands were swollen. Nearly six months later the inoculated animal died and post-mortem an advanced endocarditis was found and yellow nodules the size of rice grains scattered in the lungs, some of them caseating.

This patient's condition was treated with xylol, 20 drops, in vaseline an ounce; later with Lugol's solution 3 parts to 1 part of glycerine, and the lesion cleared in 40 days.

H. Harold Scott.

CASTELLANI (Aldo). **A New Type of Blastomycosis Cutis: (Furunculosis Cryptococcica, Folliculitis Decalvans Cryptococcica).**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp. 326–328. With 1 fig.

Report of a case of folliculitis decalvans of the scalp from the pustular lesions of which, in addition to *S. aureus*, a Cryptococcus was demonstrated culturally (on glucose agar) as an abundant white growth becoming yellowish later and showing a yeast-like organism on microscopical examination. This was agglutinated by the patient's serum in high dilution (1 in 400). Healing was obtained by injections of cryptococcus vaccine and by massive doses of potassium iodide, though staphylococcus vaccine had been given previously without any beneficial effect.

W. J. O.

RODRIGUEZ ARJONA (Vicente). **Contribución al estudio de las enfermedades tropicales. El "Mal del Pinto" de la peninsula de Yucatan.** [Contribution to the Study of Tropical Diseases. "Pinto" in Yucatan.]—*Rev. Méd. et Hyg. Trop.* 1924. May–July. Vol. 16. No. 5. pp. 142–150. With 2 figs. [9 refs.]

"Pinto" in Yucatan as described in this paper is always the white variety, and differs from the chromogenic forms in that there is no itching, no excoriation, and no desquamation. The patches appear suddenly and progress, sometimes very slowly, fresh spots developing for years and coalescing to produce large white "geographical" areas; at other times they may become arrested early. They may be seen on any part of the body. The skin is smooth and the cutaneous functions are unimpaired, though the parts affected are more sensitive than normal to heat or to the prick of insects. They persist throughout life. No parasite has been found, and examination of scrapings of the skin reveals nothing abnormal, and no treatment is of any avail. The author thinks that the cause may be some fungus involving the deeper layers of the skin and originating from the almost exclusive use of maize in the diet of the people.

H. Harold Scott.

CATSARAS (Joh.). **Ueber einen Fall von indischen Maduraarm (Mycetoma brachii).** [A Case of Indian Madura Arm.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. June 6. Vol. 250. No. 1–2. pp. 244–251. With 3 text figs. [10 refs.]

Attention is drawn to the numerous cases of mycetoma observed outside tropical countries, of which cases 15 had been reported to 1917. In all six cases had been observed in Greece, of which four showed *Streptothrix madurae* and two an *Aspergillus*. This paper concerns the preserved amputated left arm (sent from Calcutta) of a 30 years' old Hindu woman, in whom the disease had been of 11 years' duration. The greatest thickening of the limb was about the elbow region, declining gradually towards the arm and forearm. The hand was completely free and its softness in obvious contrast to the swelling of the forearm. The most numerous lesions were about the posterior aspect of the elbow and on the ulnar surface of the forearm. The bones showed porosis and sclerosis; the elbow joint was ankylosed. The whole musculature about the elbow joint was for the most part replaced by masses of hard greyish-white connective tissue. The histological picture of the skin is described, as are also the changes observed in the deeper tissue and bones, which latter showed no evidence of caries. While the nature of the fungus obviously could not be established, the microscopical picture suggested a streptothrix which did not entirely conform to the description of *Streptothrix madurae* of Vincent.

W. J. O.

AUDRAIN (L. C.). **A Case of Mycetoma.**—*Jl. Amer. Med. Assoc.* 1924. Oct. 11. Vol. 83. No. 15. p. 1165. [1 ref.]

Report from Mexico of a case in a youth, aged 18. Six injections of neoarsphenamin produced no improvement. Later eighteen intravenous injections of 10 cc. 1 per cent. mercurochrome-220 soluble and neoarsphenamin 0·75 gm. in alternate weeks caused healing of the sinuses and disappearance of the swelling, the foot becoming freely movable. In an interesting note attention is drawn to the natives' superstition regarding this disease.

W. J. O.

MONTPELLIER (J.). **Deuxième cas algérien de mycétome du pied (type "pied de Madura"), dû à l'***Aleurisma apiospermum*.—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 755–757.

Mycological report of the morphology and cultural characteristics of a fungus obtained from a case of mycetoma not described. The observation that the addition of a decoction of eucalyptus leaves to all the culture media exerted a preventive action is noted, with the suggestion of its possible therapeutic value.

W. J. O.

BURNET (Et.), BROC (R.), BRUN (G.) & JAMIN (H.). **XIIIe observation tunisienne de mycétome. Extension de l'infection aux ganglions cruraux inguinaux et iliaques.**—*Arch. Inst. Pasteur de Tunis.* 1924. Oct. Vol. 13. No. 3 & 4. pp. 306–309. With 2 figs. [2 refs.]

Report of a case, male, of 4 years' duration, due to infection of Nocardia, commencing as warty lesions on the plantar aspect of the left foot. Six months previous to coming under observation the inguinal glands (left) had become enlarged and there now showed a mass of multiple painless swellings in Scarpa's triangle in various stages of softening and fluctuation, with cutaneous lesions resembling those on the foot. In addition there were two discrete cutaneous tumours on the thigh. Surgical exploration revealed infection of the iliac glands. Cultures from all lesions examined gave the same Nocardia fungus without any secondary bacterial contamination. Examination of an inguinal gland showed the presence of fine filaments without any "club" elements. The authors had been able to find recorded in the literature only two observations of extension by the lymphatics giving rise to similar metastatic infective lesions.

W. J. O.

REMLINGER (P.). **Sur la fréquence des staphylococcies cutanées à Tanger.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 757–761. [4 refs.]

The remarkable frequency of cutaneous staphylococcal affections occurring among all classes of society in Tangiers is noted. Two factors are considered to be mainly responsible: (1) the primitive sanitary arrangements, combined with the customary sweeping of the streets during the hottest hours of the day, and (2) the frequent and violent winds. Under the existing conditions preventive measures lie in the avoidance of any form of skin irritation, in the careful washing of the clothes, and in suitable dieting.

W. J. O.

CUNNINGHAM (J.) & RAMAKRISHNAN (S.). **A Note on the Cause of Pemphigus Contagiosus (Manson).**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 559–560. [4 refs.]

This condition of pyosis mansoni is characterized by a papular eruption, becoming first vesicular and rapidly pustular, with a well-marked reddish ring and little crust formation. The lesions are distributed mainly on the extremities and less commonly in the axillae. A haemolytic streptococcus, isolated from the early vesicles, showed the cultural fermentation reaction of *S. subacidus* of HOLMAN's classification. The aurococcus (WINSLOW and ROGERS) is considered to be a secondary contamination. Vaccine (streptococcus) therapy gives unfailing beneficial results.

W. J. O.

DELANOË, Mme. **Sur un cas d'aïnhum chez une femme marocaine.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 482–484. With 1 text fig. [4 refs.]

Case report concerning a woman in whom the condition was of 15 years' duration. Examination of the amputated stump showed marked rarefaction of the bones. This deformity is considered to be due to vascular obliteration following the inflammatory changes of some initial trauma.

W. J. O.

WELCH (R. S. G.). **Ainhum.**—*U.S. Nav. Med. Bull.* 1924. Sept. Vol. 21. No. 3. pp. 352–355. With 1 plate.

Two cases are reported from St. Croix, the second of these being more particularly interesting as the condition was in a comparatively early stage. About one year previous to her coming under observation this negress, aged 46 years, had begun to experience pain, at first intermittent to become constant, in the left little toe, At the same time she noticed a constriction at the base of the same toe, which was slightly swollen and enlarged on the distal side of the constriction and showed slight impairment of tactile sensibility. " X-ray examination of left foot: Atrophy of shaft of proximal phalanx of left little toe, with thinning of cortex. No other bone pathology." There was no positive family history or clinical and laboratory evidence of other disease. Disarticulation at the metatarso-phalangeal joint was performed. The theory of a trophoneurotic etiology, possibly combined with some traumatic element, is suggested for this case.

W. J. O.

VALERIO (Americo). **Sobre um caso de "ainhum."**—*Arch. Brasileiros de Med.* 1924. Oct. Vol. 14. No. 10. pp. 605–608.

Two cases are here mentioned; in one the toe condition began six years previously, and the patient had also suffered from caries of the spine for two years. There was free mobility of the toe, but the digit was exquisitely painful and tender to touch, especially in the sulcus. In a second case the condition was symmetrical in both feet and there was some doubt in the author's mind whether it was not a case of symmetrical gangrene. This is interesting in view of the fact that Professor Pereira GUIMARÃES has previously compared ainhum with Raynaud's disease.

H. Harold Scott.

BEVEN (J. O.). **Ainhum in a Supernumerary Digit.**—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. p. 250.

This brief note mentions the occurrence of vigorous bleeding from the apparently normal artery severed when amputating the finger, showing that the condition is not due to an endarteritis obliterans.

W. J. O.

JEWELL (N. P.). **A Case somewhat resembling Ainhum.**—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 250–251.

Case report of a native showing necrosis of the first phalanx of the left great toe with the normal interphalangeal groove on the plantar aspect extending into the joint which was completely destroyed. Apart from this groove the skin of the toe was apparently healthy and sensitive. On the right foot the skin of the corresponding groove showed chronic inflammation with a small amount of granulation tissue and serous discharge, which change was apparently confined to the skin. No history could be obtained. Unlike the lesion of ainhum, in this case the constricting groove was only on the plantar aspect of each affected toe.

W. J. O.

KANDELAKI (S.). **[Ulcus tropicum phagedenicum im Kaukasus.]**—*Mediz. Sbornik Sakawkasja.* 1923. No. 1. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 300.]

This condition was observed in about 10 per cent. of ambulatory patients in a village near Baku, and during the famine appeared as an epidemic among the anaemic and malaria patients, especially among those walking bare-footed. The disease occurred in the warm marshy districts of the Caucasus, more particularly in the season corresponding to the increase of blood-sucking insects.

W. J. O.

HOUSSIAU. **Traitement de l'ulcère phagédénique tropical per les injections intramusculaires de sels de bismuth.**—*Bruxelles Méd.* 1924. Sept. 21. Vol. 4. No. 72. pp. 1354–1356. With 1 fig.

Report of a case of 3½ months' duration, previously treated with local caustics and neosalvarsan injections without result, which almost completely healed after three intramuscular injections in successive days of 3 cc. succinate of bismuth followed by two further injections at 2 and 3 days' intervals. Local applications of bismuth hydroxide in oily suspension were employed concurrently.

W. J. O.

SCHOCHET (S. S.). **Granuloma Inguinale with the Report of a Case observed in Chicago.**—*Surgery, Gynecology & Obstetrics.* 1924. June. Vol. 38. No. 6. pp. 759–767. With 4 text figs. [46 refs.]

A case of granuloma inguinale of 5 years' duration and successfully treated with antimony injections is reported. A general account of the disease is given. One point in the differential diagnosis is emphasized—that this condition is never associated *per se* with general adenopathy. PRESTLEY'S warning that prolonged use of antimony produces fatty degeneration of the liver, kidney, heart and muscular tissue of the diaphragm is quoted. It is suggested that granuloma inguinale be made a notifiable disease, since 66 cases (45 males, 21 females) have been reported in the United States during the past three years.

W. J. O.

MURDOCK (T. P.). **Report of Case of Granuloma Inguinale.**—*Boston Med. & Surg. Jl.* 1924. Sept. 18. Vol. 191. No. 12. pp. 539–540. [10 refs.]

Report of a case in a man, aged 28 years, in whom the skin lesions had appeared one month after exposure to infection by sexual intercourse. He had never been to the tropics. There was no sign of any other associated condition or history of trauma. Donovan's organisms were observed in smears obtained from the lesions, which healed under specific treatment by intravenous injections of tartar emetic. This is said to be only the second case reported from Connecticut.

W. J. O.

RANDALL (Alexander). **Two New Antimony Compounds for Intravenous Use. A Study of their Therapeutic Value in Cases of Granuloma Inguinale.**—*Amer. Jl. Med. Sciences.* 1924. Nov. Vol. 168. No. 5. (No. 632). pp. 729–749. [73 refs.]

Ten cases of granuloma inguinale are reported. Of these 5 were treated with intravenous injections of triamide of antimony thioglycollic acid (T.A.T.) in 0·4 per cent. sol., 2 with sodium antimony thioglycollate (S.A.T.) in 0·5–1 per cent. sol., and 3 with injections of both preparations. Healing occurred in 9 of these patients, none of whom showed any ill effects of antimony poisoning, though 5 of the cases treated had previously shown intolerance to tartar emetic. The chemistry of these compounds is discussed and the experimental estimation of their lethal dosage compared with that of tartar emetic. S.A.T., with the highest antimony content appears to be the least toxic of the 3 antimony preparations and is of higher solubility than T.A.T. which cannot therefore be used in such concentrated doses. It is advised that these synthetic preparations be given every second day and that at least 12 further injections be given after the first healing has taken place ; subcutaneous and intramuscular injections appeared to cause pain.

W. J. O.

THIERFELDER (M. U.). **De oorsprong van het venerisch granuloom en de oorzaken der granuloomepidemie op Nederlandsch Zuid-Nieuw-Guinea.** [The Origin of Granuloma Venereum and the Causes of the Granuloma Epidemic in Southern Dutch New Guinea.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 838-843.

Europeans as well as natives are convinced that granuloma venereum had been imported into the island since its occupation. This opinion may be accounted for by the erroneous identification of the disease with syphilis. No foreigners, however, are known to have been infected with granuloma. Before the epidemic outbreak cases are known to have occurred in villages far from the occupied parts of the island. The affection appears to be a specifically tropical venereal disease, perhaps endemic in all tropical countries.

The author thinks that the following factors explain the epidemic outbreak. Before medical treatment could be obtained by the natives the affected individuals shortly after the onset of the disease were excluded from sexual intercourse by the rapid destruction of the genital parts ; thus the spreading of the disease was restricted. Medical treatment, though not effecting a real cure, resulted in a decreased virulence of the affection in many patients, who subsequently contributed to the spread of the disease. The comparative safety after the occupation and the more intensive communication between the villages since is another factor.

W. J. Bais.

JUNÈS (E.) & BUCKWELL (P.). **Chronique du** *Xeroderma pigmentosum* **en Tunisie. Xe observation (14e cas) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS & BUCKWELL] ; **XIe observation (cas 15 et 16) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS) ; **XIIe observation (17e cas) de** *Xeroderma pigmentosum* **observé en Tunisie** [JUNÈS & BUCKWELL].—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 226–232. With 1 plate. [4 refs.]

Reports of three clinically typical cases of xeroderma pigmentosum. Report No. 11 (case 15) concerned a congenital syphilitic child, aged 8 years, with tertiary cutaneous and ocular lesions and a positive Wassermann reaction. Report No. 12 (case 17) is of interest in that the patient was a man, aged 60–70 years, in whom the skin condition dated from the age of two years, while the skin tumours had been first observed after his fiftieth year.

W. J. O.

CANGE (A.) & ARGAUD (R.). **Nodosités juxta-articulaires, pian et syphilis.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June Vol. 2. No. 2. pp. 196–199. [1 ref.]

The main interest of this short contribution (to confirm the syphilitic etiology of juxta-articular nodules) lies in the abstracts quoted from the medical literature of 1838 and 1842 describing the occurrence of yaws in Algeria, in contradistinction to its rare incidence at the present time in the experience of Cange and Argaud and of other medical officers in the country from whom information was sought on this particular circumstance. It is suggested that the writers of these early communications may have confused the framboesiform lesions of syphilis with those of yaws.

W. J. O.

GOUGEROT & LE CONIAT. **Nodosités juxta-articulaires syphilitiques des deux genoux chez une française n'ayant jamais quitté la France.** *Bruxelles-Méd.* 1924. June 26. Vol. 4. No. 59. pp. 1057–1059. With 1 fig. [2 refs.]

Case report concerning a woman, aged 62 years, with the lesions in question of some few months' duration and with ulceration of three of them. Complete resolution of all nodules followed sulfarsenol treatment. The title of this communication explains the chief interest of the case.

W. J. O.

JESSNER (Max). **Ueber juxtaartikuläre Knotenbildungen.**—*Klin. Woch.* 1924. Aug. 12. Vol. 3. No. 33. pp. 1499–1501. [61 refs.]

A comprehensive general account of the lesions which in the writer's opinion owe their origin to probably more than one pathological factor. A useful bibliography is added.

W. J. O.

CARTER (F. R.). **Granuloma Inguinale. Report of a Case; a Review of the Literature; and Comments suggested by a Review of all Cases reported to date.**—*Urologic & Cutaneous Rev.* 1923. Sept. Vol. 27. No. 9. pp. 539–546. [40 refs.]

GOODMAN (Herman). **Ulcerating Granuloma (Granuloma Inguinale). A Pictorial Presentation of Tropical and Temperate Zone Experience.**—*Urologic & Cutaneous Rev.* 1923. Feb. Vol. 27. No. 2. pp. 86–92. With 31 figs.

RABIES: A REVIEW OF RECENT ARTICLES. II.*

The literature on Rabies published during the last six months is varied in character. Though nothing of startling importance has emerged from the various researches which have been undertaken, there is yet record of valuable experimental work on the one hand, and of useful practical application on the other. To the former class belongs the work of **Remlinger** & **Curasson**[1] proving the identity with rabies of Oulou Fato—a disease of dogs which is prevalent in Northern Africa, and the work of **Imamura** & **Ando**[2] on the cultivation of the virus. Amongst the latter may be included the extension of prophylactic vaccination of dogs against the disease, as a measure of epidemic control, in Japan[3], in the States of Connecticut[4] and Massachusetts[5], and in Barcelona[6]. A number of general articles have been published, as is to be expected in the case of a disease regarding which there is much ignorance and apathy, even amongst the medical profession. **Jeunhomme**[7] contributes an instructive editorial to the *Presse Médicale* on the early history of the disease. **Marti**[6] discusses recent work on etiology and prophylaxis, and **Michalka**[8] writes a general essay on the diagnosis of rabies in animals. **Remlinger**[9] summarizes the advances which have been achieved during the last ten years. **Fermi**[10] publishes a brochure comparing in the fullest detail his own method with all other existing methods. It is to be regretted that there is so much evidence of provincialism in the writings of many authors on rabies. The dried cord school ignores the existence of those who use carbolized vaccines and *vice versa.*

It is unfortunate that the name of **Pasteur** should be associated with a particular technique of treatment. The vaccinal treatment of the disease is due to **Pasteur**, and to him alone. His was a far larger concept, and we make bold to state that he would have been the first to accept any modification of technical detail, which, in the light of further discovery, might have proved to be advantageous. It might be preferable to speak rather of Pasteurian treatment (var. HÖGYES, FERMI, or dried cord, as the case might be.)

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* For the first of this series see Vol. 21, pp. 708–714.

[1] **Remlinger** & **Curasson**. Identité de l'Oulou Fato (maladie du chien fou de l'Ouest africain) et de la rage.—*Bull. Acad. Méd.* 1924. Nov. 11. 3rd Ser. Year 88. Vol. 92. pp. 1112–1117.

[2] **Imamura** (Arao) & **Ando** (Keisaburo). On the Behaviour of Rabies-Virus in Vitro.—*Scientific Reports from Govt. Inst. for Infect. Diseases.* Tokyo. 1923. Vol. 2. pp. 357–365. (9 refs.)

[3] **Hata** (S.). The Protection of Dogs against Rabies by Umeno's Method of Preventive Inoculation.—*Jl. Immunol.* 1924. May. Vol. 9. No. 3. pp. 89–93.

[4] **Corwin** (George E.). The Control of Rabies in Connecticut.—*Amer. Jl. Public Health.* 1924. Aug. Vol. 14 No. 8. pp. 688–692.

[5] **Bigelow** (George H.) & **Webber** (Wolfert G.). Rabies: a Community Problem.—*Boston Med. & Surg. Jl.* 1924. Sept. 25. Vol. 191. No. 13. pp. 582–585. With 2 figs.

[6] **Salvat Marti** (José). Los nuevos estudios acerca de la etiologia y profilaxis de la rabia.—*Rev. Espanola Med. y Cirug.* Barcelona. 1924. Oct. Vol. 7. No. 76. pp. 593–595. (1 ref.)

[7] **Jeunhomme** (P.). A propos de la rage: vieille histoire.—*Presse Med.* 1924. Sept. 13. Vol. 32. No. 74. Supplément. pp. 1551–1554.

[8] **Michalka** (J.). Die Diagnose der Wut bei Tieren.—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 5–6. pp. 147–152.

[9] **Remlinger** (P.). Les travaux sur la rage pendant ces dix dernières années.—*Arch. Inst. Pasteur de Tunis.* 1924. Oct. Vol. 13. No. 3 & 4. pp. 310–350. (186 refs.)

[10] **Fermi** (Claudio). I metodi Fermi di vaccinazione e di siero-vaccinazione antirabbica confrontati con tutti gli altri metodi esistenti. Studio critico sperimentale.—146 pp. Pubblicato per cura dell' Istituto Sieroterapico Milanese.

Mutation of the Virus.—NICOLLE & BURNET[11], following LEVADITI, NICOLAU & SCHOEN (this *Bulletin*, Vol. 21, p. 708 (ref. 3)) have attempted to reverse the alteration of street virus into fixed virus, which is brought about by passage in rabbits. They aim at achieving this object by passaging fixed virus through dogs. They are now at the eleventh passage, and no modification has occurred, either in the clinical character of the disease, or in the reappearance of Negri bodies. The authors start from the assumption that the nature of the virus depends upon the species of animal in whose tissues it is grown. If, as others hold, the tissue and not the species of animal is the influencing factor (*i.e.*, F.V. is a brain virus, whereas S.V. has to make its way through various tissues), then this experiment is not likely to lead to the desired result.

LEVADITI, NICOLAU & SCHOEN [12] consider that fixed virus is neurotropic, and that this faculty is attained by mutation. The rate of mutation varies with the number of Negri bodies which the original street virus brain contains. Viruses which were poor in Negri bodies quickly became fixed—and *vice versa*. The mutation was found to oscillate, and is ascribed to the influence of two factors—the intrinsic character of the strain and the sensitivity of the animal inoculated. They found no absolute relation between the period of incubation and prevalence of Negri bodies, though in any one strain there was an association between these two characters.

Diffusivity and Cultivation of the Virus.—IMAMURA & ANDO[2] set themselves two problems : (1) Does the virus, when a virulent medulla is brought in contact with a fluid medium, diffuse into that medium ? and (2) How long does such a virus maintain its virulence in various fluid media ? The media employed were inactivated horse serum, rabbit plasma in normal saline, Ringer's solution, culture broth, distilled water, and glycerine diluted with 2 vols. of normal saline. The experiments were carried out at 37°C., under anaerobic conditions. Out of 262 animals, 116 contracted disease when inoculated with portions of medulla which had been kept in one or other of the above media. None of the animals inoculated with the fluid media developed rabies. In these experiments the authors claim that the virus does not diffuse (*cf.* REMLINGER, various notes in the *Comptes Rendus de la Société de Biologie* from 1917 to 1918, and *Annales de l'Institut Pasteur*, 1919, p. 28). Incidently, they found that the best of the above fluid media for preserving the virus in solid medullae was rabbit plasma (citrated to contain 0·5 per cent. sodium citrate), diluted with an equal part of physiological saline solution. In this the medulla remained virulent for 15 days, whereas in the glycerine solution it was potent for 6 to 7 days only.

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[11] NICOLLE (Ch.) & BURNET (Et). Sur la restauration du virus fixe.—*C. R. Soc. Biol.* 1924. July 11. Vol. 91. No. 24. pp. 366–368.

[12] LEVADITI (C.), NICOLAU (S.) & SCHOEN (R.). Antagonisme entre le virus rabique fixe et le virus des rues ; mécanisme de la mutation du virus des rues en virus fixe.—*C. R. Soc. Biol.* 1924. July 18. Vol. 91. No. 25. pp. 423–426. (3 refs.)

They then turned their attention to cultivation of the virus, and investigated media containing 0·3 to 0·45 per cent. Na. Cit. diluted with one to four times its volume with saline solution. The solid substratum of the culture medium was a portion of normal rabbit's medulla. Subsequently test inoculations were made from the piece of normal medulla, and from the fluid medium. In 12 out of 14 cases the medulla had become infective, and in no case did the surrounding fluid convey infection. They conclude that the virus requires living tissue for its multiplication, and that there is no evidence of diffusion into the fluid, or of multiplication in any of the fluid media which they investigated. This confirms the work of VOLPINO (*Presse Medicale*, 1914, p. 79), and of KRAUS & BARBARA (*Presse Medical*, Argentina, 10th June, 1914), and appears to shed considerable light on the vexed question of the cultivation of the virus.

CARONIA & SINDONI[13], on the other hand, recognised a minute micro-organism—at the limit of visibility—which was gram positive, and stained with Löffler's blue in Tarozzi-Noguchi cultures of fixed virus. These bodies were identical with those they observed in the medulla of fixed virus rabbits, and in a child's brain. Inoculation with the fluid medium from the first to the sixth generation conveyed the disease.

Experimental rabies in animals.—BEDIER & CHASSIGNEUX[14], in the course of passaging the virus in use at Dakar, experienced difficulties due to (1) early deaths of rabbits after intracranial inoculation, (2) failures in the conveyance of infection, and (3) the occurrence of abnormal cases in which torticollis and chorea were a symptomatic feature. The virus was in its 39th passage, and the accidents occurred only in months of August and September, 1922, and September and October of 1923.

ARLOING & THÉVENOT[15] describe experiments in which rabies was conveyed to guineapigs by inoculation into the cavities of the heart, and into the muscles of the neck.

Preservation of the Virus.—We have already referred to the work of IMAMURA & ANDO[2] on rabbit plasma. REMLINGER[16] has examined the qualities of oil to which camphor has been added (L'huile camphrée), as a preservative. The results were good, but the camphor caused symptoms of irritation in animals inoculated, which limit its application—*inter alia* he states that a medulla keeps its virulence for 40 days in talc, for 50 in powdered sugar, for 61 in sea salt, and for 72 in a sterilized glass vessel.

PUNTONI[17] has found that the keeping properties of the virus in glycerine is profoundly influenced by the temperature. At 37°C. it is almost destroyed, whereas at 0°C. street virus preserves its virulence for thirteen months, and fixed virus for fifteen months. He observed also that keeping in glycerine at 0°C. has the effect of shortening the incubation period. This he ascribes not to an alteration in the rate of multiplication of the organism, nor to the presence of antagonistic substances which are destroyed by the glycerine, nor to the formation of aggressins, but to a modification of the virus itself, which, however, is not transmitted to the next passage.

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[13] CARONIA (G.) & SINDONI (M. B.). Ricerche sulla etiologia della rabbia. Nota preventiva.—*Pediatria*. 1924. July 15. Vol. 32. No. 14. pp. 817–823. With 1 plate.

[14] BÉDIER (E.) & CHASSIGNEUX (A.). Au sujet de quelques accidents observés à Dakar au cours des passages de virus rabique. *Bull. Soc. Path. Exot.* 1924. Vol. 17. No. 6. pp. 511–514. With 1 text fig.

[15] ARLOING (Fernand) & THÉVENOT (Lucien). Sur la rage expérimentale du cobaye.—*Rev. Path. Comp. et Hyg. Gén.* 1924. Aug. 5–20. Vol. 24. No. 258–259. pp. 543–544. (3 refs.)

[16] REMLINGER (P.). Conservation du virus rabique dans l'huile camphrée.—*C. R. Soc. Biol.* 1924. July 11. Vol. 91. No. 24. pp. 350–351. (2 refs.)

[17] PUNTONI (Vittorio). Effetti dells glicerina e del freddo sulla sopravvivenza e sul periodo di incubazione del virus rabico.—*Ann. d' Igiene.* 1924. Oct. Vol. 34. No. 10. pp. 716–721.

Diagnosis. (1).—*The Staining of Negri Bodies.*—ADRIANI[18] uses the following method:—

Fix in acetone 1–2 hours. Xylol ½ hour. Xylol and paraffin ½ hour. paraffin 1 hour—cut—Xylol—abs. alc. Then stain for 5 to 10 minutes in

Malachite green	20 cgm.
Orange G.	2 gm.
90 per cent. alcohol	10 cc.
Distilled water	105 cc.

The section is then placed without washing for 2 to 3 minutes in

Chromic acid	50 cgm.
Potass. Alum.	1 cgm.
Distilled Water	100 cc.

Washed 20 seconds and carried through as usual. The Negri bodies appear green on an orange ground. Internal vacuoles and corpuscles of Volpino are seen. The method is claimed to be more rapid and less difficult than that of MANN and the preparations have very good lasting properties.

GALLEGO[19] describes a method of staining which, from the illustrations reproduced in his paper, appears to give good results. He fixes in 10 per cent. formaldehyde (46 hours at 37°, 24 hours in the cold or 21 minutes in urgent cases).

The tissues are cut by a freezing microtome, and not in paraffin, the reagents used are

(*a*) Nitro-ferric solution :	
Aq. dest.	10 cc.
Nitric acid	1 drop.
Perchloride of iron (Poulenc or Merck) diluted in water to 10 per cent. ...	1 drop.
(*b*) Carbol-fuchsin solution :	
Aq. dest.	10 cc.
Ziehl's carbol-fuchsin	15 drops.
Acetic acid	1 drop.
(*c*) Nitro-ferric formol :	
Aq. dest.	10 cc.
Formol	2 drops.
Nitric acid	1 drop.
Perchloride of iron diluted to 10 per cent.	1 drop.

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[18] ANDRIANI (S.). Méthode simple et rapide pour mettre en évidence les corps de Negri dans la rage.—*Ann. Inst. Pasteur.* 1924. June. Vol. 38. No. 6. pp. 520–522. With 1 fig.

[19] GALLEGO (Abelardo). Contribución al diagnóstico histológico de la rabia Método rápido, sencillo y seguro para la coloración de los corpúsculos de Negri en los cortes.—*Rev. Hig. y Sanidad Pecuarias.* Madrid. 1924. Aug. Vol. 14. No. 8. pp. 499–502. With 2 figs.

(*d*) Picro-indigo-carmin : according to the formula of Cajal—

10 per cent. watery solution of indigo-carmin ... ... } equal parts.
Saturated watery solution of picric acid }

The procedure is as follows :—

1. Fix in 10 per cent. formol for 21 minutes.
2. Cut frozen sections.
3. Sensitize in solution (*a*) for half to one minute.
4. *Without washing* stain in (*b*) for 5 minutes.
5. Wash in water.
6. Place in solution (*c*) for 5 minutes and wash in water.
7. Stain with (*d*) for one minute, again wash.
8. Dehydrate in 95 per cent. alcohol.
9. Clear in carbol xylol (5 per cent.) or in bergamot oil.
10. Mount in Canada balsam.

Nuclei stain violet, protoplasm azure or green azure, the homogeneous substance of the Negri bodies green or rose-green, and the inner formations a pale violet.

A faster modification is to use a stronger solution of carbol-fuchsin (30 drops in 10 cc. aq. dest.) for one minute, and to use solution (*c*) for one minute only.

2. *Inoculation by Lumbar puncture.*—Lapponi[20] uses lumbar puncture for animal experiment. Difficulties due to regurgitation are removed, and time is saved as the incubation period is shorter than after subdural inoculation. The onset of symptoms with 27 strains of street virus (examined by both methods) was as follows :—

Subdural.		*Lumbar.*	
Days after inoculation.	Number of animals showing 1st symptoms.	Days after inoculation.	Number of animals showing 1st symptoms.
11	1	9	2
13	1	10	5
14	1	11	12
15	3	12	5
16	5	13	3
17	12		
18	3		
24	1		

Thus, amongst the 27 strains, the mean incubation period after subdural inoculation was 16½ days, whereas after inoculation by lumbar puncture it was only 10 2–3 days. Also the variability of the incubation periods was much reduced.

Variations of street virus.—Remlinger[21] describes a street virus of a very potent character. It was obtained from a fox eighteen months old which died of classic paralytic rabies of maxillary type. A rabbit inoculated with this strain became ill on the eighth day and died on the ninth day. Deaths occurred in successive passages on the 8, 7, 7, 8, 6, 7, 7 and 6th days respectively. The duration of illness in each case was one day.

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[20] Lapponi (D.). Inoculazione endorachidea del virus da strada nella diagnosi biologica della rabbia.—*Ann. d' Igiene.* 1924. July. Vol. 34. No. 7. pp. 492–496.

[21] Remlinger (P.). Sur un virus de rue renforcé recueilli au Maroc.—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 538–539. (2 refs.)

Under this heading we may also refer to the work of REMLINGER & CURASSON[1] upon the identity with rabies of Oulou Fato—a disease of mad dogs which occurs in West Africa and in the Sudan. The disease has been recorded since 1815. It is said to be transmissible from dog to dog, but not from dog to man—apart from this it has the characters of dumb rabies. A virus was obtained and subpassaged—it gave incubation periods of from 15 to 17 days. Successive passages were carried out. The behaviour of the virus was identical with that of rabies. Cross immunization and inoculation experiments were carried out with this and the virus mentioned in the preceding paragraph. The two were identical. The authors conclude that persons bitten by a dog suffering from this disease should be sent for treatment without delay.

Epidemiology.—The increased prevalence of rabies in Tcheco-slovakia is a matter of concern (MARX[22]). This is particularly marked in the provinces of Böhmen (802 rabid dogs in 1921, as compared with 1,675 in 1922), and of Mähren (322 as compared with 621). Human cases have also approximately doubled during this period, and the number of patients receiving treatment at the Pasteur Institute at Weinberge has similarly increased.

CORWIN[4] in dealing with an epidemic in the State of Connecticut has made important observations on the potency of individual dogs as disseminators of the disease. His table may be reproduced in full. It describes the depredations committed by individual dogs, whose course was traced in detail.

Starting point.	Miles travelled.	Number of dogs known to have been bitten.
Suffield	15	27
East Windsor	7	12
South Windsor	10	7
Vernon	30	7
Somers	40	12
Manchester	18	9
Old Lyme	12	4
Norwich	15	15

Thus the average excursion amongst these dogs was 18 miles, and in one case it was as much as 40—and the average number of new foci which might later become active was 12 from each dog.

BIGELOW & WEBBER[5] state that this epidemic has spread into Massachusetts. Maps are printed which show the localization of rabies in the N.E. corner of the State in 1923, whereas in 1924 it has diffused westwards.

Control of rabies by the prophylactic vaccination of dogs.—A number of papers have been published upon this very important subject. It centres upon the question whether a significant protection against rabies infection can be achieved by the administration of a single dose of a rabies vaccine. An excellent review of the present situation is published in the *Revista de Medicina Veterinaria*[23] (Buenos Ayres). It contains a bibliography which is so complete that we have taken the liberty of transcribing it (*see below*, p. 252).

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[22] **MARX (Anton Maria). Die gerichtsärztliche Beurteilung von Lyssafällen. Gleichzeitig eine Mitteilung ueber die Ausbreitung der Lyssa in der tschechoslowakischen Republik.—*Med. Klin.* 1924. Sept. 14. Vol. 20. No. 37. (1031). pp. 1287–1290. (7 refs.)**

HATA[3] publishes the results which have so far been obtained in Japan by the method of UMENO & DOI. This consists in the administration of a single treatment of vaccine prepared as follows:—One part of fixed-virus brain is mixed with five parts of a solution consisting of sixty parts of glycerine and forty parts of 1·25 per cent. phenol in physiological saline. After thorough intermixture the emulsion is filtered, and kept in a thermostat at 20°C. for two weeks (during which time the vaccine looses virulence). The resulting vaccine kills rabbits, but does not convey infection to dogs, though in the latter a considerable degree of immunity is achieved. Two doses of 3 cc. each are administered, one on the chest and the other in the back.

The results in Tokio and Yokohama were as follows. Treatment was commenced in these two areas in 1919 and 1918 respectively:—

TOKIO.

	Number of dogs treated.	Number developing rabies within a year.	Number of uninoculated dogs which developed rabies.
1916 ..	—	—	428
1917 ..	—	—	456
1918 ..	—	—	511
*1919 ..	15,552	2	464
1920 ..	14,635	0	265
1921 ..	24,085	24	382
1922 ..	19,826	5	212

YOKOHAMA.

1916 ..	—	—	131
1917 ..	—	—	149
†1918 ..	6,644	0	213
1919 ..	9,150	0	44
1920 ..	2,927	1	43
1921 ..	10,951	0	62
	387‡	9‡	—
1922 ..	410	0	14

* Treatment commenced.

The total number of dogs was estimated to be about 30,000.

† Treatment commenced.

Total number of dogs about 15,000.

‡ These were treated with a vaccine which had not been properly attenuated. The nine dogs died immediately from its effects.

A further table shows that in Japan generally there had been no similar decline in rabies.

It would appear then that this method of control had been successful in Japan.

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[23] REVISTA DE MEDICINA VETERINARIA. Buenos Aires. 1924. June–July. Vol. 7. No. 2. pp. 82–87. (14 refs.).—El tratamiento de la rabia en los animales. La vacunación antirrábica preventiva de los perros. (Revista sintética.)

CORWIN[4], and BIGELOW & WEBBER[5] strongly recommend the same method—out of 1,600 dogs inoculated by the former in Connecticut, six were subsequently bitten by rabid dogs, None of these developed rabies. In particular a certain rabid dog bit two unvaccinated dogs and one which had been vaccinated; the two former died, the latter escaped.

MARTI[6] relates experience and further statistics from Barcelona, from the United States, and from Baden-Baden.

BIGELOW & WEBBER[5] inform us that in the municipalities of Englewood and Orange, in the State of New Jersey, legislative action in this direction has been taken.

Whilst, of course, such statistics as are available are insufficient to prove in a rigorous manner the efficacy of the treatment, it is clear that there is much to be said in favour of the introduction of this method of control into areas in which it is possible to deal with a significant proportion of the canine population. Apart from all other reasons, there always remains in the background the fact that any method of administration which rouses a community out of the prevailing apathy with regard to rabies will ultimately have the effect of reducing the prevalence of the scourge. In the words of JEUNHOMME[7], it is the bounden duty of everyone who lives in an area in which rabies is epidemic " conspirer sans cesse contra la liberté du chien." This does not apply to the British Isles, where quarantine is completely effective. The reviewer is not sufficiently acquainted with the conditions which prevail in the islands of Japan to say whether these should also be excepted.

Statistics of Treatment.—The Paris figures[24] for the last two years show a zero mortality amongst 754 and 727 cases treated.

SCHWEINBURG[25] deals with the statistics of the Vienna Institute for the last 25 years. The total mortality amongst 12,056 persons who received full treatment was 1·23 per cent. The failure rate was 0·8 per cent. He claims that as a result of the treatment there has been a reduction to at least one fifth of those who would otherwise have succumbed. The method of treatment employed for the majority of cases was that of dried cords given over a period of fourteen days, and commencing with 5 day dried cord. Since 1921 the Ether method of REMLINGER & ALIVISATOS has been employed for severely bitten persons. This has in his opinion lowered the failure rate. Prior to 1921 it was about 0·68 per cent.—whilst in 1921 it was 0·4, in 1922 it was 0·3 and in 1923 it was 0·24 per cent. He points out that the latter two percentages are due to five deaths which occurred amongst the lightly bittēn who had not been treated by the ether vaccine.

ABEN-ATHAR[26] gives statistics from the Institute at Para in which dried medullas are employed. The course lasts from 18 to 21 days,

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[24] VIALA (Jules). Les vaccinations antirabiques à l'Institut Pasteur en 1923. *Ann. Inst. Pasteur.* 1924. July. Vol. 38. No. 7. pp. 648–650.

[25] SCHWEINBURG (Fritz). Bericht ueber die Tätigkeit der Schutzimpfungsanstalt gegen Wut in den ersten 25 Jahren ihres Bestandes nebst Bemerkungen ueber Methodik und Erfolge der Schutzimpfung.—*Seuchenbekampfung.* Vienna. 1924. Vol. 1. No. 5-6. pp. 135–147.

[26] ABEN-ATHAR (Jayme Jacintho). Vaccinação anti-rabica. Accidentes e mortalidade.—*Sciencia Med.* 1924. Sept. 30. Vol. 2. No. 9. pp. 445–451.

Before 1920 periods of drying were from 10 to 2 days; since that date they have been from 6 to 1 day. The results were as follows:—

	Treated.	Deaths.	Total mortality rate.	Failure rate.
1917 ..	71	2	2·81%	0%
1918 ..	168	1	—	·59%
1919 ..	273	4	1·46%	·73%
1920 ..	198	0	0	0
1921 ..	171	0	0	0
1922 ..	345	0	0	0
1923 ..	228	0	0	0

Methods of treatment.—KIRSCHNER[27],[28], in a communication dealing with the effects of freezing and drying upon micro-organisms in general, devotes a portion of his paper to the case of rabies virus. He finds that dried virus which has previously been frozen retains its virulence for a much longer period than virus which has been exsiccated at ordinary temperatures. This he claims to be due to depression of physiological function at low temperatures, such that vital processes are suspended and that the plasma passes into a stable condition.

MORISON[29] has administered intravenous injections of SEMPLE'S vaccine to 169 severely bitten persons. This method of treatment is used as a preface to ordinary subcutaneous inoculation, and three to seven doses have been given in each case intravenously. Two hundred and twenty doses varying in volume up to 5 cc., and introduced at the rate of half a cc. per minute, have been administered with no ill effects. Amongst 96 persons to whom 5 to 7 such doses have been administered no failures have occurred. The vaccine is carefully filtered.

Paralytic accidents.—KRAUS[30] examines the prevalence of paralytic accidents after various methods of treatment, and finds that these occur much less frequently after treatment by HÖGYES' dilution method, and by dried cords method in which a relatively small quantity of nerve-substance is introduced. SCHWEINBURG[31] continues this examination from the experimental point of view. He was able to produce the condition by the inoculation of normal nerve-substance. Amongst 62 rabbits treated with this material according to the original scheme of the dried cord method 13 (20·9 per cent.) became paralysed. Of 8 rabbits treated according to the BABES-PISCARIU modification, 2 (25 per cent.) were affected. Whereas amongst 56 rabbits treated according to the HÖGYES' scheme no accident occurred. Thus he concludes the paralysis is related to the quantity of nerve-substance employed. He therefore advocates the adoption of treatment by HÖGYES' method. This is an old story, a similar conclusion was arrived at by HARVEY & MCKENDRICK in 1908. (*Scien. Mem. Govt. of India,* No. 30, p. 30). Still, its reiteration seems to be very necessary. It is curious, however, that no mention is made of treatment by the safer methods in which carbolized virus in its various forms is employed. The attitude of FERMI in the brochure[10] to which we have already referred seemed at first to the reviewer to savour of propagandism, and to be unnecessarily combative. It would appear from the foregoing that this aggressiveness may really be a form of righteous indignation. KRAUS, as a result of his conclusions, pleads for the establishment of a conference to go into the whole matter of antirabic treatment. We are cordially in agreement with him.

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[27] KIRSCHNER (L.). Preservation of Stock Cultures of Bacteria and of Rabies-fixed Virus.—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 701–709 With 1 text fig.

[28] KIRSCHNER (L.). Lasting Conservation of Bacteria and of Fixed Rabies-Virus.—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indie.* 1924. Part III. pp. 294–301. With 1 plate and 1 text fig. Same paper as 27.

[29] MORISON (J.). Intravenous Administration of Antirabic Vaccine.—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 333–334.

[30] KRAUS (R.). Ueber die Ursachen der Schädigungen nach Schutzimpfung gegen Hundswut.—*Wien. Klin. Woch.* 1924. July 3. Vol. 37. No. 27. pp. 661–664. (24 refs.)

[31] SCHWEINBURG (Fritz). Klinische und experimentelle Beobachtungen ueber Lähmungen nach Wutschutzimpfung.—*Wien. Klin. Woch.* 1924. Aug. 14. Vol. 37. No. 33. pp. 797–801.

Miscellaneous.—TSCHEKANOWSKY & SCHABUROW[32] have prepared an antiserum and are using it therapeutically on men and animals. May they have more success than their predecessors have had!

PUNTONI[33], in discussing the question of autovaccination, that is to say treatment by a vaccine prepared from the brain of the biting animal itself, claims that this method (which is really an autogenous treatment) is superior to treatment by ordinary fixed virus. Of 37 animals which had been immunized by an autovaccine, 21 contracted rabies (56·8 per cent.) when tested with street virus, whilst of 32 immunized by ordinary fixed virus, 23 died of the disease (71·9 per cent.).

ROSSI[34] contributes an article on myosis and midriasis in rabid dogs.

A. G. McKendrick.

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[32] TSCHEKANOWSKY & SCHABUROW. Versuch zwecks Gewinnung antirhabischen Serums.—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian. pp. 137 139. German summary. pp. 216-217.

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See also UMENO (S.) & DOI (Y.). **A Study on the Anti-rabic Inoculation of Dogs and the Results of its Practical Application.**—*Kitasato Arch. Experim. Med.* 1921. Mar. Vol. 4. No. 2. pp. 89–108.

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REVIEWS AND NOTICES.

VALASSOPOULO (A.) & PÉTRIDIS (Pavlos). With Preface by RIST (E.). **Les hépatites dysentériques et leur traitement.**—pp. viii+150. With 6 figs. 1924. Paris: Masson et Cie, 120, Boulevard Saint-Germain. [Price 12 francs.]

The first part of this work deals with the medical treatment of dysenteric hepatitis, and the second with the surgical treatment of tropical abscess of the liver. The authors are members of the staff of the Greek Hospital, Alexandria. After a few words of introduction and a brief historical prologue, Dr. Valassopoulo proceeds to define dysenteric hepatitis as a specific affection of the liver consecutive to amoebic dysentery and produced by the *Entamoeba histolytica* in habitual association with the microbes of suppuration, the bacteria being conveyed to the liver by the amoebae. He is manifestly sceptical as to the sterility of amoebic abscesses, and records that out of fourteen cases the pus from which was examined in his hospital laboratory, in only one was it found to be sterile, and in that two co-existing non-sterile abscesses were subsequently discovered. He quotes KRUSE & PASQUALE to the effect that large quantities of pus should be examined in these cases, the pyogenic organisms being present only in small numbers, and mentions that GAUDUCHEAU has found in such material a minute streptococcus culture of which, on ordinary media, would be hardly visible.

The author notes that abscesses have been discovered in cirrhotic livers, but finds ROGERS' theory of chronic cirrhotic changes consequent upon amoebiasis difficult to accept. In describing the symptoms pointing to abscess formation, a persistent hypo-eosinophilia is mentioned as a bad prognostic sign. A reference is made to amoebic cholecystitis the pathogeny of which is explained.

The chapter on diagnosis is a good one, Confusion between dysenteric hepatitis and malarial enlargement of the liver is said to be frequent in Egypt. The importance in some cases of anti-syphilitic treatment is emphasized, whilst the value of the emetine test and of radiography is fully recognized. The views of ROGERS on the degree and nature of the leucocytosis pointing to multiple abscess are quoted with approval.

Enthusiastic on the subject of emetine, Dr. Valassopoulo urges the necessity of successive courses of treatment, and the advisability of subsequently keeping the patient under observation. He testifies to the fact that abortive treatment by emetine has served to clear up innumerable cases of hepatitis progressing towards suppuration, and even to cure recent abscesses verified by puncture without recourse to further surgical intervention, but in regard to chronic cases expresses the opinion, unsupported, however, by any data, that combined treatment by emetine and aspiration will not suffice. He then discusses the types of case, mainly those of long standing abscess or of extreme physical debility, to which emetine treatment is not in the first instance applicable, and records the fact that in the hundreds of cases in which he has administered the drug he has encountered no serious accidents.

More than half of the surgical portion of the book, by Dr. Pavlos Pétridis, is devoted to interesting records of cases, some recent and some of ancient date, illustrating vividly the difficulties frequently experienced in differential diagnosis and sometimes in locating the seat of the abscess even after open operation. The author demonstrates that exploratory puncture cannot always be relied on to furnish proof of the non-existence of an abscess, and he moreover regards blind puncture of the liver as a procedure by no means free from danger, *e.g.*, from haemorrhage. With the object of avoiding these dangers, and securing free access to both surfaces of the organ, the author's father, Dr. Aristide Pétridis introduced more than twenty years ago an operation of trans-pleural laparotomy designated by the unwieldy name of "Polypleurodiaphragmatotomy." For the different steps of this procedure, which, though apparently formidable, presents no real difficulties to the surgeon, the reader is referred to some excellent illustrations in the original. The operation is said to be equally applicable to either right or left side. The author recommends it for all cases where exploration through the thorax is indicated. When the abscess is thought to be situated in the anterior part of the liver corresponding to the epigastric region he practises an incision in the shape of an inverted V, the summit corresponding to the Xiphoid cartilage, and the lateral branches to the respective costal margins.

Dr. Pétridis makes no direct reference to the combined method of treatment by emetine and aspiration, in spite of the statement of his medical colleague referred to above. His objections to blind puncture perhaps suffice in his own mind to condemn a very distinct advance in treatment practised with extraordinary success by many observers, and in their opinion applicable to a great majority of cases. The work closes with an excellent chapter on migrations of liver pus into super- and sub-diaphragmatic regions.

J. J. Pratt.

LACAPÈRE, with the collaboration of LAURENT (Ch.). **Le traitement de la syphilis par les composés arsenicaux et les préparations bismuthiques avec l'exposé des nouvelles méthodes de laboratoire.** 4th Edition. pp. vii+341. With 14 figs. 1925. Paris: Masson et Cie, 120 Boulevard Saint-Germain. [Price 16 fr.]

The first four chapters of this work are devoted to a review of the various preparations of mercury, arsenic and bismuth used in the treatment of syphilis, with a discussion as to the efficacy of each preparation, the indications and contra-indications in their use and details of dosage, mode of employment, etc. The dissertation on the use of bismuth salts is particularly interesting wherein the author deals fully with the constitution of the various bismuth preparations, their rate of absorption and elimination and the *raison d'être* of the method of their employment. The number of bismuth compounds on the market is very large already and continues to increase and it is essential that the practitioner shall know what he is using and why he is using it. Too often the treatment of syphilis has been stereotyped, whereas in reality it is necessary to study each individual case in devising (and revising) the appropriate treatment. This volume gives in easily accessible form all the requisite information towards this end. In chapter V are discussed the principles guiding the method of associating the various drugs in treatment, while in chapter VI the "incidents and accidents" attending treatment are very clearly set forth. The last chapter in Part I of the book consisting of 68 pages devoted to laboratory methods for the diagnosis of syphilis contains nothing new.

In Part II the author discusses treatment from the point of view of the disease in its various manifestations including a chapter on prophylaxis and anticipatory treatment. All the reasoning is sound and clear and agrees in general with principles laid down by authorities in this country.

There is no index, but the subject-matter is so arranged that the Table of Contents gives immediate reference to any point. The subject is presented in a clear and straightforward way, which will be appreciated by the English reader, for whom many books by French authors possess a quality which distracts the attention.

Hugh S. Stannus.

DELAMARE (G.). **Spirochétoses respiratoires stomatogènes.**—143 pp. With 14 figs. 1924. Paris: Masson et Cie, 120, Boulevard Saint-Germain.

In this monograph, Professor Delamare of the Faculty of Medicine in Constantinople, has attempted to bring together all the facts relating to the group of spirochaetes which have been found associated with affections of the respiratory tract. This association, in spite of an ever increasing array of clinical observations, remains little more than a clinical observation, and the author has done well in pointing out the defects in our knowledge of the subject and the danger accruing with the habit of labelling spirochaetes, discovered in some small number of clinical cases, with a definite specific name, thus creating a number of disease entities which do not rest on a sound basis. The variety in morphological and other characteristics of these organisms in any single case is such as to suggest a warning against attempting to deal with the subject in water-tight compartments, while the underlying pathology is uncertain and experimental research almost entirely barren of results.

Professor Delamare considers that a re-opening of the whole subject is necessary. For him, all the various types of spirochaetes which have been described as occurring in the respiratory tract are varieties of VINCENT's organism. He goes further and believes that the similar organisms found in the bowel (*S. eurygyrata*) are merely colon varieties of *S. vincenti*. He finds no evidence in favour of believing that there is a specific respiratory spirochaete of tropical countries, as described by CASTELLANI, and relegates this disease to the position of a syndrome, expelling *S. bronchialis* from medical nomenclature. He shows that cases of bronchial spirochaetosis have now been found scattered all over the world; that the disease is cosmopolitan, occurs in all latitudes, on the seaboard and inland and in all races. He believes, and brings evidence to show, that the chief etiological factor acting as a predisposing cause is a suitable "terrain"—the body must provide a suitable soil—this being determined by general debilitating influences and influences acting locally upon some system of the body. Thus he explains the occurrence of these infections in natives of the tropics as seen by CASTELLANI and others, in persons suffering from the many debilitating diseases, poor conditions of feeding, etc., of these countries. He shows that the number of cases recorded rose rapidly in 1918 at the time of the influenza pandemic, and refers to the fact that spirochaetes have beeen found by some observers in the sputa of 3 per cent. cases of pulmonary tuberculosis, and are associated with paragonimiasis, also to the association, on the other hand, of bowel spirochaetes with amoebiasis.

Speaking of the diversity of the lesions produced and the unity of the etiological cause, Professor Delamare says: "Regarding *S. vincenti* it attacks equally the bronchi or alveoli, and there, as elsewhere, gives rise to simple erosions, ulcerations, larger or smaller areas of necrosis or haemorrhages. Though giving rise alternatively to a haemorrhagic bronchitis, a fetid bronchitis or pulmonary gangrene, an ulcerating balanitis or hospital gangrene, a catarrhal or ulcerative enteritis, the organism *S. vincenti* remains identical, while it is the local flora and other local conditions which vary" and give rise to the varied clinical picture. In all these cases the author sees the results of an occasional pathogenicity on the part of a saprophytic mouth spirochaete. He would include them all under the term Fusospirochètose cosmopolite. Reference is made to the lacunae in our knowledge of the relationship of the spirochete and the fusiform bacillus and of the reason of this association or non-association in various cases.

In a long chapter on symptomatology reference is made to the numerous types of spirochaetal infections of the respiratory tract under bronchitis, acute, subacute and chronic, and a special type marked by extreme cachexia; latent forms and "formes frustes"; types characterized by sputa, muco-purulent, bloody or fetid; forms with symptoms and signs of rhinitis (rare), laryngitis (serious), pulmonary congestion, consolidation, broncho-pneumonic patches, gangrene, or secondary infection of the pleura.

The author mentions that no attempt has been made to show the presence of a haemolysin or spirochaetolysin in the serum of patients, nor has any cutireaction been devised, also that pulmonary osteo-arthropathies never occur in this infection. The treatment advocated depends upon the association with other diseases; with bronchomycosis lipiodol intravenously: with paragonimiasis antimony; with amoebiasis emetine; in cases of gangrene novarsenobenzol; and would give a trial to the last-named drug in most other cases.

Hugh S. Stannus.

ROGERS (Leonard) [C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., I.M.S. (retd.), Physician and Lecturer, London School of Tropical Medicine; late Professor of Pathology, Calcutta Medical College.] & MUIR (Ernest) [M.D., F.R.C.S. Edin., Research Worker in Leprosy at the School of Tropical Medicine and Hygiene, Calcutta.] **Leprosy. Including in Amplified Form the First Three Croonian Lectures for 1924 delivered before the Royal College of Physicians of London by the First-named Author.**—pp. xii+301. With 65 figs. (including 32 plates & 1 map). 1925. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. [Price 12s. 6d. cloth covers & 10s. 6d. paper covers.]

This book appears very opportunely at a time when much public interest has been aroused in the miserable condition of the sufferers from this terrible disease, and when modern improvements in diagnosis and treatment justify a more optimistic view of their prospects in the future.

In Europe the number of lepers has steadily declined with the progress of general hygiene and sanitation, but in many other parts of the world the disease still persists on a large scale. According to the official census of 1920, there were over 100,000 known lepers in India; in tropical Africa, the authors consider that the total number "cannot well be less than 500,000, and may easily amount to double that number" if early cases are included. The authors give geographical estimates of numbers, but such estimates are of value only for purposes of comparison. In many instances the data are extremely meagre, and even where official statistics are available, these can represent only the fairly advanced and easily recognizable cases. In most Oriental countries, too, the statistics relating to the adult female population are notoriously inaccurate. Since the onset of leprosy is usually so very insidious, it is certain that very many lepers escape enumeration. It is, indeed, the difficulty of early diagnosis that constitutes the most serious aspect of the leprosy problem. Even the medical practitioner in tropical countries (and it is in hot damp climates that the disease is most prevalent) does not usually see cases in the very early stages. Owing to ignorance, and perhaps more often to a natural dread that their own suspicions may be confirmed, patients with early lesions are reluctant to seek advice; more often it is only when the condition is unmistakable that they present themselves for treatment.

It is to be hoped that, as lepers become aware of the favourable results of modern treatment, they will avail themselves in increasing numbers of the greatly improved prospect of recovery that lies before them. But since, even under the most favourable conditions of early diagnosis and skilful treatment, so much depends upon the intelligence, patience, and willing co-operation of the leper, a very notable diminution in the number of lepers throughout the world can scarcely be anticipated in the immediate future.

Sir Leonard Rogers has given an interesting, though rather brief, sketch of the history of leprosy. He quotes many cases which appear to afford conclusive proof of the communicability of the disease through prolonged and close contact with lepers. There appears to be no reliable evidence incriminating biting insects, but the house-fly may possibly play some part in the spread of the disease. There are two valuable chapters on prophylaxis. The authors describe what they consider to be the ideal methods, and then discuss how these may require modification in different countries, according to the various hygienic, educational, financial, political and other conditions. In the clinical section, the descriptions of the different types of leprosy, and of the lesions caused by it, are realistic and graphic. In the chapter on diagnosis stress is naturally laid upon the great importance of early recognition of the disease, and the procedure to be followed is carefully described.

Probably most readers will turn with the greatest interest to the section on treatment. It is a difficult matter to appraise the value of any particular line of treatment. The disease is usually of very long duration, its lesions develop slowly, and spontaneous arrest, or even an apparent cure, is not at all uncommon; hence great caution is necessary in drawing conclusions as to the efficacy of any remedy. Moreover, there is no doubt that many febrile reactions, irrespective of their cause, are followed by at least temporary improvement. One cannot wonder that in such an apparently hopeless malady recourse has been had to many very different forms of treatment; and, for almost all of them, some favourable evidence, more or less convincing, may be found. DEYCKE'S Nastin and ROST'S Leprolin are examples of remedies, the early reputation of which has not been confirmed by time. Amidst all the vicissitudes of therapeutic fashions, chaulmoogra and hydnocarpus oils have been recognized as valuable in the treatment of leprosy for very many years. To Sir Leonard Rogers is due the great credit of devising preparations of the essential constituents of these oils, which, compared with the crude preparations previously used, are both more efficacious in their action and far less painful and irritating in administration. Detailed accounts are given of the methods of preparation, of injection, and dosage of the esters of chaulmoogra and other oils, and there are striking photographs illustrating their beneficial effects. There is an interesting section on the nature of the action on leprosy of these preparations. The authors are of opinion that, besides the benefit derived from the local reaction produced by injection of these irritants, there is a definite specific action upon the bacilli. There will be general approval of the recommendation here made of a combination of therapeutic agents, including injection of chaulmoogra and other oils, local applications to destroy leprous nodules and patches, potassium iodide for its "sensitizing" effect, with tonics, exercise, and close attention to general hygienic conditions.

There remains the all-important question; what are the prospects of a real cure for the leper? This is answered by the authors as follows: "In the third stage of the disease,provided exciting causes can be removed, the hope of a steadily diminishing infection can, as a rule, be held out to the patient, the duration of the disease being largely determined by the grossness of the infection, the severity of the treatment which the patient is subjected to or is able to bear, the state of his general health, and his activity in his habits. In the first and second stages . . . there is . . . some degree of uncertainty whether, even under the best available treatment, the disease can be arrested without passing through the third stage . . . When a patient has lost all active signs of the disease without passing through the third stage, becomes bacteriologically negative after all signs of nerve lesions [have disappeared], except such as may be due to permanent destruction of nerve-fibres or sensory end organs, and shows no signs of new lesions for two years, he may be said to be relatively cured. The term *absolute* cure should be reserved for those who have passed through the third stage, and have a high degree of immunity. It will be realised that without this immunity in a disease in which the germs can lie latent for over twenty years, it is impossible to prophesy that circumstances will not occur in which some few lepra bacilli, still hiding among the tissues of the body, will again produce the disease in a patient who formerly suffered, and is now apparently cured." No one with any experience of leprosy will be inclined to cavil at the admirable restraint and moderation of this statement.

The authors are to be warmly congratulated on the production of this work, so free from bias, so expressive of a very close study and intimate acquaintance with the disease, and so full of original observations, reasoned conclusions, and practical advice. It cannot fail to promote a more general interest in, and sympathy with, the very numerous sufferers from this depressing scourge of humanity, and it will surely lead to an alleviation of their unhappy lot. The volume is well produced, and is illustrated by more than sixty excellent diagrams and photographs.

H. J. Walton.

TROPICAL DISEASES BUREAU

TROPICAL DISEASES
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RECENT DEVELOPMENTS IN THE TREATMENT OF AMOEBIASIS.

By Philip MANSON-BAHR, D.S.O., M.D., F.R.C.P.,
D.T.M. & H. Cantab.,
Sectional Editor, Tropical Diseases Bureau.

In this résumé an attempt has been made to collate the more recent methods of treatment for amoebiasis. The variety of methods may be taken as an index of the uncertainty that still exists regarding the mode of action of the alkaloids of ipecacuanha upon the *Entamoeba histolytica*. ROGERS, in his original experiments, concluded that emetine exerted a direct action upon the parasite, whilst DALE and DOBELL, from their experiments on *E. histolytica* infection in kittens, regarded the failure of emetine to eradicate the infection in these animals as indicating that the drug acted, not directly upon the entamoebae, but in some unascertained manner upon the host itself. Research has consequently been undertaken in other directions with a view to the discovery of a more efficient drug. In future, however, the exact mode of action of these various agents will doubtless be determined by experiments in vitro with artificial cultures of *Entamoeba histolytica* itself according to the successful method so recently elaborated by BOECK and DRBOHLAV.

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DRBOHLAV (J.) *Trans. Roy. Soc. Trop. Med. & Hyg.*, 1924, xviii, 238–240.

I. INTESTINAL AMOEBIASIS.

Emetine.—As stated in the last critical review on dysentery (Vol. 18, p. 321), emetine injections, uncombined with other treatment, appear to be insufficient to eradicate an amoebic infection from the bowel, though undoubtedly they are of very great value in the acute stage of the disease. The maximum number of injections, according to JEPPS, should not exceed 12 of 1 gr. each on consecutive days, or symptoms of emetine intoxication are apt to ensue. VACCAREZZA is of the opinion that failure with emetine is usually due, either to the employment of too small a dose, or to the cessation of treatment immediately the symptoms disappear : treatment should be commenced early, carried out intensively and systematically repeated ; the maximum dosage he employs is 0·15 gm. (or 2⅓ gr.) daily for not more than four days ; or 0·10 gm. (1½ gr.) for not more than seven days. Connor appears to have had exceptional success with the emetine treatment carried out as follows in Ancon Hospital from 1914–1918 : After a preliminary purge with castor oil, large doses of bismuth subnitrate are exhibited to check the diarrhoea ; emetine is then given in four treatments, three to five days apart in severe, less frequently in mild, infections. The customary dose is 1 gr. ; the average per patient 8–10 gr. More than 100 cases of amoebic dysentery have thus been successfully treated since 1914. Cawston suggests that the pain commonly caused by emetine injections can be avoided by intramuscular administration and by dissolving the alkaloid in 1 per cent. carbolic acid immediately before injection. Sellards and Leiva have ascertained that in kittens emetine injections do not prevent the subsequent development of amoebic dysentery, and that relatively much larger doses are requisite in cats than are necessary in man. In these animals, however, emetine injected in solution into the rectum is more efficacious than given subcutaneously. The dosage for cats by the rectal route is 10 mgm. per kilo and the drug is given in 1 : 1,000 solution.

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* References throughout are to the summaries in this *Bulletin* unless otherwise stated.

Acting on this suggestion, Willmore supplements oral administration of emetine by medication *per rectum*. Emetine base 1 gr. is mixed with ether (6ʒ) and olive oil (8℥) and, after a preliminary washout, injected slowly into the bowel ; the patient being retained in a position as much " inverted " as possible. These injections are given on alternate days, 6–12 completing a course which should be controlled by sigmoidoscopic examination. [According to the reviewer's experience, emetine injections *per rectum* in man are extremely irritating and painful. When given in a dilution of 1 : 2,000 (2½ gr. emetine in 12 ozs. of water) they produce intense intestinal spasm which may last 4–6 hours, and in 2 cases under his care have actually kindled an acute attack in chronic infections. In a third case, however, when given twice weekly for 3 weeks on end, a favourable result was obtained, the patient having remained free from relapses ever since—*i.e.*, a year from cessation of treatment.]

Intravenous injection of emetine, though discountenanced by Sellards and Leiva, is advocated by Petzetakis, who gives gradually increasing doses commencing with 0·03 gm. up to a maximum of 0·1 gm. (1½ gr.), making a total of 0·35–0·45 gm. (7 gr.) within 10 days, and reports rapid and striking results, superior to the intramuscular or subcutaneous methods usually employed. As may be surmised, and as Bensaude, Cain and Rachet have shown, intravenous injections of emetine are apt to be followed by nausea and vomiting, which may supervene ¼–1 hour after the injection. Delayed toxic symptoms, due to the cumulative action of the drug, manifest themselves in asthenia, polyneuritis and cardiac complications.

References.

Emetine.—Jepps (M. W.) xix, 30 ; Vaccarezza (R. F.) xix, 30 ; Connor (R. C.) xix, 327 ; Cawston (F. G.) xx, 112 ; Sellards (A. W.) & Leiva (L.) xxii, 9.

Intravenous.—Petzetakis, xxi, 342 & xxii, 6 ; Bensaude, Cain & Rachet, xxi, 686.

Lavage.—Sellards (A. W.) & Leiva (L.) xx, 402. Willmore (J. G.) xx, 708.

Ipecacuanha compounds.—LE NOIR and DE FOSSEY find RAVAUT'S paste combined with intravenous injections of salvarsan (0·3 gm.) gives "very favourable results." The treatment is continued for 12 days, Ravaut's paste being given alternately.* WILLMORE considers that it is a useful adjunct, but has no real curative value. ROUX advocates hypodermic injection of total ipecacuanha—powdered ipecacuanha put up in ampoules containing 20 cgm. to every cc. of liquid; in severe cases two injections are given daily.

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Ipecacuanha and Compounds.—LE NOIR & DE FOSSEY (M.) xix, 688; ROUX (F.) xxi, 28.

Emetine bismuthous iodide and Emetine periodide.—The efficacy of E.B.I. in eradicating chronic amoebic infections appears to have been definitely proved, though there is undoubtedly a residuum of resistant cases. In these, of which the reviewer has had many examples, little seems to be gained by persisting in the drug after it has had a thorough trial. Many practitioners are deterred from giving E.B.I. because of the unpleasant symptoms which are apt to follow. Methods which have been devised with a view to obviate its therapeutic defects often appear to result in non-absorption of the drug. Thus JEPPS finds that salol-coated pills of E.B.I. are unsatisfactory; over 45 per cent. of her cases relapsed after such a course of treatment. Liquid paraffin makes an excellent excipient, 3 gr. being dissolved in half-an-ounce of liquid paraffin. If dropped into a glass containing two to three ounces of water the dose is easily taken. Given by this method unpleasant sequelae followed only in 10 instances in 75 cases treated, and only 12·7 per cent. out of a large series relapsed after a course of 36 grains. RENNIE reporting upon the cases of intestinal amoebiasis treated at the Hospital for Tropical Diseases, London, concludes that the best form of exhibiting E.B.I. is as a loose powder in gelatin capsules.† Three of these, each containing 1 gr. of E.B.I., are given on empty stomach last thing at night. Should the patient be intolerant, 10 minims of tinct. opii are given half-an-hour beforehand. The patient must be in bed, the diet light and easily assimilable and not necessarily restricted to milk. Delayed vomiting (four hours after ingestion) does not indicate non-absorption, but rather that the drug is having therapeutic effect. Diarrhoea occurring during an E.B.I. course should be regarded as similarly indicative; as a rule three or four dark fluid motions should be passed daily. Restriction in diet for a month subsequent to treatment is advisable. Most patients lose weight during the course of treatment, but rapidly regain it after. MARTINDALE points out that, contrary to accepted opinion, E.B.I. is soluble in the acid of the gastric juice with the liberation of emetine in solution. WILLMORE has adopted the practice of administering 60 gr. of emetine-bismuth-iodide during 20 days, and in the same period injecting 10 gr. of emetine. Of 358 cases thus treated, 28 per cent. were cured after the first course; 20 per cent. after a second course; and 5 per cent. after a third course. 100 per cent. of those receiving more than 3 courses relapsed. From these figures WILLMORE concludes that neither emetine nor emetine-bismuth-iodide is a specific cure, though both are valuable drugs. The worst cases to cure are those that pass from one acute relapse into another, in which encystment of *E. histolytica* does not take place. The difficulty of treating the colon by medication by the mouth is due (according to WILLMORE) to the drug having to travel 25 ft. before it can exercise its effect. Treatment by the mouth should, therefore, be supplemented by rectal enemata (see p. 260).

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* Powdered charcoal, powdered subnitrate of bismuth, syrup, glycerin, of each 100 gm. Powdered ipecacuanha, 4 gm.

† The E.B.I. is manufactured by Messrs. Burroughs, Wellcome & Co., the gelatin capsules—size No. 2—are supplied by Parke, Davis & Co.

Emetine periodide (G_{29} H_{40} N_2 O_4 6I), prepared by MARTINDALE, contains 38·7 per cent. emetine and 61·3 per cent. iodine. It is extremely soluble in alcohol and other solvents. In contrast with E.B.I., it liberates practically no emetine in the presence of acids ; but in 2 per cent. sodium bicarbonate solution the emetine is liberated. It is given in capsules in doses of 2 gr. three times daily together with 5 gr. tablets of *fel bovinum*, which is said to increase the absorption. It is regarded by WILLMORE as equal, if not superior, to E.B.I., is much less toxic, and is not liable to be followed by nausea and vomiting, nor by cardiac or muscular weakness, depression, or desquamation of the skin, as in the case of E.B.I. It may be given as an intensive 15 days' course of 90 gr., and this may be repeated after 10 days' interval. WILLMORE'S cases which had proved refractory to E.B.I. reacted with this treatment. GORDON, however, has not formed an equally high opinion of this drug—out of 16 cases, 50 per cent. relapsed within one month ; its administration in gelatin capsules was not satisfactory, as they frequently passed through the gut without dissolving. When given as powder mixed with milk, it did not produce vomiting.

In the reviewer's opinion E.P.I. is more easily tolerated by the patient, but is much less efficacious than is E.B.I. in getting rid of a chronic infection.

REFERENCES.

Emetine Bismuthous Iodide and Emetine Periodide.—JEPPS (M. W.) xix, 30 ; RENNIE (P. M.) xx, 404 ; MARTINDALE (W. H.) xx, 404 ; WILLMORE (J. G.) xx, 708 ; MARTINDALE (W. H.) xx, 710 ; GORDON (R. M.) xxi, 27.

Yatren ($C_9H_6O_4$ SNI) is a combination of 28 per cent. iodine with oxyquinoline-sulphonic acid together with a proportion of sodium bicarbonate (about 20 per cent.). Under the name of *Yatren purissimum—No. 105*—it is manufactured by the Behring Institute, Marburg-Lahn, Germany, and has been used for some time as an antiseptic. Quite recently it has been advocated as a lavage in intestinal toxaemia. It is a pale yellow powder which easily absorbs moisture and must therefore be kept dry, otherwise the sulphonic acid will combine with the soda constituent. When stirred in hot water at 80° C. it dissolves with the liberation of CO_2 ; sterilization by boiling is therefore not advisable. At ordinary temperatures it is soluble to the extent of 4 per cent. The iodine is in fairly firm combination and does not give a violet reaction with chloroform. Yatren is rapidly absorbed and is to a great extent excreted in the urine, where after 5 or 6 hours it can be verified by the iron perchloride test with which it gives a green colour. In amoebic dysentery Yatren is exhibited in two ways—in pill, containing 0·25 gm. (4 gr.), or cachet, containing 0·5 gm. (7½ gr.) by the mouth, in total dosage of 1 gm. (15·4 gr.) daily, or by enema of 3–5 gm. dissolved in 200 cc. of water at 80° C. An enema should not exceed 1 litre, and the solution is run into the bowel at body temperature by means of a funnel and tube. As a general rule, the patient is able to retain it for several hours, and it is best given during the evening so as to remain in the bowel during the night.

In 1921, MÜHLENS and MENK reported the cure by Yatren of two resistant cases of amoebic dysentery which had undergone appendicostomy and caecostomy without success, and improvement in six other resistant cases. They recommend that, if ulceration of the bowel be found on sigmoidoscopic examination, enemata (5 per cent. solution) be given daily for 8–14 days, and after a week's interval be repeated for 3–7 days. During active treatment rest and strict dieting are necessary. MENK (1922) regards Yatren as a valuable adjunct to emetine and E.B.I. treatment in resistant cases and recommends a course lasting 5–6 weeks. BIRT (1923) reports on 28 cases treated in Shanghai, of which 16 were regarded as cured. He considers the best results are obtained by enema in 10 per cent. solution in quantities of 100 cc. daily. In old standing cases the injection appears to cause no inconvenience, but in the acute stage it may give rise to definite pain. BAX considers Yatren treatment superior to all other. He gives the drug in 3 gm. doses daily in cachets for 10 consecutive days, the patient remaining in bed upon a milk diet, and a second course in seven days' time. A painless diarrhoea ensues from absorption of the drug. From observations extending over a year he concluded that a permanent cure had resulted in 16 cases. Other observers—GORDON and LICHTENSTEIN—have recorded less favourable results.

REFERENCES.

Yatren.—MÜHLENS (P.) & MENK (W.) xix, 31 ; MELLO (S.) xx, 112 ; MENK (W.) xx, 112 ; BIRT (E.) xx, 405 ; KUENEN (W. A.) xx, 405 ; MENK (W.) xx, 405 ; HUPPENBAUER (K.) xx. 712 ; GORDON (R. M.) xxi, 27 ; MENK (W.) xxi, 29 ; DE LANGEN (C. D.) xxi, 29 ; LICHTENSTEIN (A.) xxi, 29 ; KOP (W. A.) xxii, 8 ; TRAVAGLINO (P. H. M.) & SOEDJONO (R. M.) xxii, 9 ; BEHRINGWERKE MITTEILUNGEN, Vol. III, YATREN IN THEORIE UND PRAXIS, 1924 (Selbsverlag der Behringwerke Marburg-Lahn) ; JACOBI (E.) *Deut. Med. Woch.*, 1924, 1, 1614 ; BAX (W. F.) *Arch. f. Schiffs- u. Trop.-Hyg.*, 1924, xxviii, 479–483.

Salvarsan.—Salvarsan and its derivatives were advocated as adjuvants to emetine treatment in the last review of this subject (see this *Bulletin*, Vol. 18, p. 322), their use being suggested by their tonic effect against the depression caused by emetine. MONTIER testifies to its value in resistant cases. He gives two capsules containing novarsenobenzol 0·05 gm. daily by the mouth, or in the form of an enema—0·3 gm. in 60 cc. of water. According to RAVAUT the treatment should extend over a period of 40 days. FRANÇON and HUTINEL think that the best results are obtained by a combination of emetine and novarsenobillon, conveniently styled by them ENV. Four injections of 0·3 gm. each are given at four days' interval, while on the three intervening days emetine is injected in gradually increasing doses of 4, 6, and 8 cgm. : the emetine is suspended and the novarsenobillon injections are continued in the same dose every four days till a series of 10 have been injected altogether.

REFERENCES.

Salvarsan.—MONTIER (F.) xx, 400 ; RAVAUT (P.) xx, 404 ; FRANÇON (F.) & HUTINEL (J.) xxi, 685.

Stovarsol.—Stovarsol (acetyl-oxy-amino-phenyl-arsinic acid), a preparation introduced by FOURNEAU (Fourneau 190), has been used on a large scale by FOURNIER in the treatment of syphilis. It is a tasteless substance, absorbed without the production of any disagreeable phenomena, and is given by the mouth in 4 gr. tablets. Stovarsol has been reported upon mainly from French sources. It was first applied to the treatment of amoebic dysentery by Marchoux (1922), who found that cysts of *E. histolytica* which had persisted after a full course of emetine treatment disappeared after the exhibition of stovarsol 4 gr. twice daily ; a course of 20 pills or tablets cured a case of four years' duration. In refractory cases he gives 4 gr. doses every second day for two months. Latterly, Garin and Lépine, Nogue and Leger, and Delanoë have reported favourable results, expressing the opinion that stovarsol should be regarded merely as an adjuvant to emetine treatment, and that it does not necessarily protect against relapses. Flandin favours a new allied compound known as tréparsol (meta-amino-para-oxy-phenyl arsinic acid), which contains 28·75 per cent. of arsenic, as compared to 27·2 per cent. in stovarsol. It is apparently given in the same dosage. These drugs are decomposed in the intestine and eliminated in the urine.

The reviewer has lately had considerable success in two emetine-resistant cases of amoebic dysentery with stovarsol in the doses recommended above. Material improvement in the general condition of the patients was noted together with the disappearance from the faeces of *E. histolytica* cysts which had persisted after a thorough course of emetine bismuth iodide.

References.

Stovarsol.—Marchoux (E.) xx, 712 ; Nogue & Leger (M.) xxi, 30 ; Delanoe (P.) xxi, 345 ; *ibid.* xxi, 678 ; Garin (Ch.) & Lépine (P.) *Presse Méd.* 1924, xxxii, 827–929 Flandin (Ch.) *Bull. et Mém. Soc. Méd. des Hôpit. de Paris*, 1924, xlviii, 1628–1636 ; Leaflet on Stovarsol " 190 Fourneau," May & Baker Ltd.

Conessine.—Conessine, an alkaloid of the formula $C_{12}H_{20}N$, is isolated from the bark and seeds of *Holarrhena antidysenterica*, a plant known as " kurchi," which, used as an infusion, has long been held in high esteem in the Hindu Materia Medica. Conessine is 50 per cent. less toxic than emetine, but has been found by Brown to possess a strong amoebicidal action. Kurchi bark tablets (gr. xx–xxx per diem) appear to exert an inhibitory action upon the *Entamoeba histolytica*, thereby minimizing the liability to relapse in amoebic dysentery.

References.

Conessine.—Brown (H. C.) xix, 690 ; Henry (T. A.) & Brown (H. C.) xxi, 701.

Extracts of the Simarubaceae.—The reported amoebicidal action of " chaparro amargosa " has led to further investigations by Sellards and Leiva. Experiments were made with extracts of *Harrisonia perforata*, *Brucea amarissima* and *Castela nicholsoni*, the last of which was found to be most specific. Goldsmith and Greene report that all parts of the plant from root to berry are active. Six to eight ounces of the infusion are given by the mouth daily, one hour before meals, while rectal enemata of 500 to 2,000 cc. of the infusion are injected twice daily, the patient being instructed to retain the fluid as long as possible. French and Sellards consider that the active principle is probably a glucoside. During 1923 they treated seventeen cases with this drug. Extreme variation was noted in the response of individual cases; in eleven the stools became temporarily free from entamoebae, and in six the effects of the drug were striking.

REFERENCES.

Extracts of the Simarubaceae.—SELLARDS (A. W.) & LEIVA (L.) xx, 402; GOLDSMITH (A. A.) & GREENE (E. I.) xxi, 343; FRENCH (G. R. W.) & SELLARDS (A. W.) xxii, 8.

Surgical Treatment of Amoebic Dysentery.—Operative interference with the idea of diverting the faecal stream from the ulcerated area or of introducing amoebicidal solutions into the gut have so far received but scant recognition; in fact, they have been regarded with disfavour. Since 1912, SMITS has been treating cases which have proved refractory to emetine and E.B.I., by appendicostomy and irrigation through the appendix. Through a catheter the colon is flushed out first with a litre of tepid soda solution and subsequently with a similar amount of dilute silver nitrate over a period of one or two months. Experience having proved these measures inadequate, he now regards caecostomy as a better means of lavage of the ulcerated gut and giving necessary rest to the colon. For six weeks subsequent to the operation the bowel is regularly washed out with amoebicidal solutions. The bowel is then closed. In 16 cases treated in this manner the results were favourable.

REFERENCE.

Surgical Treatment.—SMITS (J. C.) xx, 106.

Other Methods.—VAN DER TOGT aims at increasing the osmotic tension in the bowel contents to a degree harmful to the entamoebae by introducing cane sugar in a concentration of 20–40 per cent. Enemata are given twice daily for eight consecutive days. According to his statement the excretion of blood and mucus soon subsides and the patients recover. The method has the advantage of being painless and cheap. SMYRNIOTIS believes that solutions of tannin cause a rapid healing of amoebic ulcerations and destruction of the entamoebae.* One enema should be given daily and the fluid retained for a quarter of an hour.

REFERENCES.

Other Methods.—VAN DER TOGT (A. C.) xix, 32; SMYRNIOTIS, xix, 32.

II. HEPATIC AMOEBIASIS AND HEPATIC ABSCESS.

A feature of the recent literature on this subject has been the growing conviction that emetine exerts a much more striking and lasting curative action in hepatic than in intestinal amoebiasis. Several recent writers believe that, in the great majority of cases, operative measures are unnecessary since, provided the collection of pus in the liver be not too extensive, emetine alone will bring about its absorption. MANINI reports a successful result after a total of 18 gr. of emetine. HODSON believes that the amoebae in the liver are killed by the emetine and that the absorption of the now inert abscess pus is brought about in much the same manner as a gumma of the liver. LENOBLE and JEGAT have verified the presence of pus in the liver by aspiration and have watched its absorption by emetine therapy. ESCOMEL, who has treated 25 cases in this manner, is of the opinion that, should no immediate improvement follow 3 gr. of emetine, the diagnosis is not correct. He thinks that whenever possible the injections should be given intravenously. **Fry** has described two cases in which large abscesses were certainly present, and in both of them all signs and symptoms disappeared after 12 gr. of emetine. He is of the opinion that absorption of sterile pus is in no way detrimental to the patient.

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* The formula recommended is: Tannin 5 gm., Tinct. opii 20 drops, arrowroot 15 gm., water 1 litre.

The reviewer has recently confirmed the view that emetine therapy alone can promote absorption of pus from a liver abscess without surgical interference. In a recent case under his care, after no less than three operations had been performed for evacuation of liver pus, the patient developed a fourth abscess, the very pronounced physical signs and symptoms of which were resolved in a short time by emetine combined with E.B.I.

Ralli and **Panayotatou** are of the opinion that, if emetine is promptly administered, the formation of liver abscess can be prevented, and they quote corroborative statistics showing that before the introduction of emetine the number of operations for liver abscess in Alexandria every year was 20-40; it is now only between 3 and 5. **Hartmann-Keppel** is of the same opinion. **Rénon** and **Blamoutier**, and **Bressot** believe in combining emetine therapy with salvarsan injections; of the latter one injection of 0·3 gm. is given weekly; they believe that this drug improves the general condition of the patient and favours cicatrization.

The aspiration of large amounts of pus from the liver by means of Potain's aspirator, a method originally suggested by **Rogers**, has gained a number of adherents for its obvious advantages over the open operation, of simplicity and avoidance of risk and shock to the patient, though **Rogers** has stated that in certain circumstances the open operation may still be necessary. **Ludlow** has abandoned open operation as a routine measure. He gives a preliminary treatment by subcutaneous injection of 0·06 gm. emetine daily for 2-4 days. Should, however, aspiration fail to remove all the pus, operation is resorted to, and emetine injections are continued afterwards until symptoms no longer persist. **Manson-Bahr**, **Low**, **Pratt** and **Gregg** report upon a series of fifteen consecutive cases without a death, all treated with aspiration, emetine and E.B.I. Injection of emetine into the abscess cavity after removal of the pus is no longer regarded as necessary. Should the pus prove too viscid for aspiration, the injection of eusol into the abscess cavity renders it sufficiently fluid to pass through the aspirating needle. The advantages of this method are stated as follows :—(1) Aspiration is a simple matter and can be undertaken where pressure on organs, such as the heart, is occurring and the patient is obviously too ill to admit of the major operation ; (2) the patient is not necessarily subjected to the ordeal and dread of a general anaesthetic ; (3) the stay in hospital is much shortened, the average being less than one month.

Thurston reports on a series of 64 cases and affirms that the aspiration treatment of liver abscess has been the operation of choice in Bengal during the last 10 years. Out of the total of 64, 49 were treated by aspiration alone, of which 40 were cured and 9 died. Of the 49, 28 were aspirated once with 4 deaths ; 12 were aspirated twice with 3 deaths ; 7 three times with one death. The largest amount of pus removed at any one aspiration was 96 ozs. ; the smallest 4 ozs. With multiple aspirations the largest amount was 220 ozs. Adequate treatment with emetine is as important as the operation. With the emptying of the abscess cavity a negative pressure is set up and an effusion of serum takes place into it; the object should be to charge this serum with emetine so as to kill off the amoebae in the outer wall of the abscess cavity. Cases in which the abscess cavity has become secondarily infected should be drained at once by means of open operation. Townsend states that aspiration should be reserved for small abscesses, and that cases showing large amounts of pus should be operated upon and drained. In order to ensure free drainage for the pus resection of a rib should be carried out.

References.

Treatment of Hepatic Amoebiasis (Hepatic Abscess).

Emetine alone.—Manini (L.) xix, 31; Hodson (V. S.) xix, 330; Lenoble (E.) & Jegat (Y.) xix 682; Falzi (O.) xix, 682; Escomel (E.) xx, 110; Hartmann-Keppel (G. L.) xxi, 21; Ralli (A.) & Panayotatou, xxi, 27; Fry (A. S.) xxii, 5.

Emetine and Salvarsan.—Rénon (L.) & Blamoutier (P.) xix, 31; Bressot (.E) xx, 108.

Aspiration and Operation.—John (J. C.) xix, 33; Rogers (L.) xix, 328; Manson-Bahr (P.), Low (G. C.), Pratt (J. J.) & Gregg (A. L.) xx, 705; Ludlow (A. L.) xx, 706; Thurston (E. O.) *Lancet*, 1924, Nov. 15, pp. 1008-1010; Townsend (R. S.) *Jour. Roy. Army Med. Corps*, 1924, xliii, 401-421.

MEDICAL ZOOLOGY.

HAUGHWOUT (Frank G.). **Has Parasitology a Place in the Medical Curriculum?**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress. Singapore,* 1923. pp. 411–419. [1 ref.]

The main argument of this thoughtful paper is that a definite course of instruction in parasitology should be included in the ordinary medical curriculum. Not a course for a zoologist or a parasitologist; but such a course as would give the ordinary medical man some practical knowledge of the methods of the laboratory and an understanding of the full physical significance of parasitism to the host; such a course as would show up parasitology as an integral part of the medical knowledge of the completely-trained clinician able to make intelligible calls on the parasitologist and to interpret the parasitologist's reports.

The author proposes a course of 50 to 60 hours in each of the three recognized branches of medical zoology. Instruction should include the morphology (and potential variation) of the species commonly met with and the habitat and life-cycle of each, with a particular reference to their bearing on pathology and symptomatology, the guiding principles in distinguishing parasitic from non-parasitic forms, and the discrimination between parasitism and commensalism: the fact that certain diseases of non-parasitic origin may be mistaken for pathological conditions caused by protozoon and helminth parasites should be impressed. Such a course, which in some respects must be discursive, can be made effective only by a teacher of broad experience.

A more advanced course, called by the author a "semi-graduate course," for the physician who intends to practise in the tropics, where he will probably have to make his own laboratory diagnoses, should be more zoological in character, but the clinical applications should never be lost sight of.

Courses still more advanced, "graduate courses," for men who intend to undertake original research in parasitology, should be restricted to such as have a bent for zoology, but even here full fruition can be enjoyed only by such as have had a medical training and maintain commerce with pathologists and clinicians. [See also NUTTALL, this *Bulletin*, Vol. 21, p. 792, and LEIPER, p. 929.]

A. Alcock.

HEGNER (Robert W.). **Parasitism among the Protozoa.**—*Scientific Monthly.* 1924. Aug. Vol. 19. pp. 140–155. With 6 figs.

This paper, being itself a critical summary, perspicacious and precise, cannot be condensed. The author, intent on significant speech, distinguishes among those intimate associations of species which are popularly spoken of as "parasitism," (1) *symbiosis,* where two species are intimately associated for mutual benefit, as the termites and their intestinal Protozoa; (2) *commensalism,* where of two intimately associated species the one is advantaged and the other does not obviously suffer detriment by association; and (3) true *parasitism*, where the one species is benefited and the other is in varying degrees deranged or damaged by the association. He allows these three distinctions, without pedantically insisting on them, but recognizing that in the case of commensalism, and even in the case of symbiosis, the balance may not always be evenly poised and has sometimes, and in particular circumstances, a suspicious tendency to incline in favour of *one* of the two associates.

Under the heading of Parasitism among the Protozoa he reviews (1) its frequency—estimating that there are as many species living on or in other organisms as there are free-living species [a high estimate when one considers all the free marine forms]; (2) the variety of specific range or restriction of the parasite within the host; (3) the variety of range of adaptation to host—the parasite sometimes adapted to one specific host and sometimes to several species of a genus or even of a larger group; and (4) the effects, in the way of simplification or complication, of a parasitic existence on the structure and life-cycle of the parasite. He also considers the origin and evolution of parasitism among Protozoa, stating a number of rational propositions for discussion. And he touches, but without particular reference to Protozoa, on the bearing of parasitism upon the genetic relations and geographical distribution of hosts. It is a profitable paper for advanced students, being distinguished for breadth of view in more senses than one.

A. A.

MAPLESTONE (P. A.). **A Survey of the Parasites found in Natives of Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 183–187. [2 refs.]

The scope of this survey was confined to the faeces of 500, the night blood of 288 and the day blood of 195 adult male prisoners in Freetown gaol. Two smears and a small emulsion in saturated salt solution were made from a specimen of one stool of each man, and these disclosed the following parasites in their respective *percentages*: *Entamoeba histolytica* 15·0, *E. coli* 43·6, *Endolimax nana* 9·8, *Iodamoeba buetschlii* 13·0, *Giardia intestinalis* 2·2, *Chilomastix mesnili* 1·8, *Trichomonas hominis* 2·2, *Enteromonas intestinalis* 2·4, (and Coprozoic flagellates 14·6); *Ascaris lumbricoides* 36·6, *Trichuris trichiura* 18·6, *Strongyloides stercoralis* 15·2, *Enterobius vermicularis* 1·6, Hookworm 76·6, Tapeworm 3·2. Thick films of night blood yielded *Microfilaria bancrofti* in 16·3 per cent. and *Mf. perstans* in 2·4 per cent. *Mf. loa* was not found in the day blood.

A. A.

DA SILVA (F. Venancio). **Note sommaire sur l'infestation parasitaire de l'intestin des indigènes d'Angola.**—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 381–388.

This paper contains some local statistics of intestinal parasite infestation at stations in Angola. The protozoon infestations, which are extraordinarily high, are stated generally as "amoebiasis" and "flagellosis," except in one instance where they are given in a detail that perhaps may carry some connotations. In this instance the examination of stools of 27 patients gave the following results in percentages: amoebiasis, 55·5; flagellosis, 44·4; Chlamydophrys, 11·1; ciliates 3·7; coccidiosis 3·7.

A. A.

ESCOMEL (E.). **Essai sur la parasitologie d'Aréquipa (Pérou) et de ses environs.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 906-925. With 2 figs.

Arequipa, in the south-western extreme of Peru, lies at an elevation of about 7,500 feet, in a valley which, though locally fertile and exuberant in vegetation, has arid and barren surroundings. It is said to be the healthiest town of S. America. Its parasitology is here systematically summarized :—

Spirochaetes and spirochaetoses.—Isolated cases of relapsing fever, sometimes associated with epidemics of typhus of imported origin, have occurred, and among apt parasites besides lice there are *Ornithodorus megninii* and *Argas persicus.* Both neurotropic and dermotropic forms of syphilis have been observed. Yaws is not endemic, though sufferers from the Brazil frontier come for cure. *Treponema bronchialis* and *T. buccale* are noted.

Protozoa.—Amoebic dysentery is not so frequent as it used to be, but amoebic hepatitis is still common owing to the local predilection for capsicum; both forms are soon cured by emetine, without surgical intervention; though injections of silver salts greatly help in banishing amoebae from the intestine. Malaria, though non-existent in Arequipa, is bad in the valleys below; all the three common parasites occur. Trypanosomiasis is not endemic, but cases of "uta" or "espundia" (dermal leishmaniasis) come up from the forest tracts of Peru, and an infection probably of *Trypanosoma cruzi* from the Brazil frontier has been noticed. The universal flagellates *Chilomastix mesnili, Giardia intestinalis,* and *Trichomonas vaginalis, intestinalis* and *buccalis* are all noted; the author believes that a local batrachian (*Telmatobius gebskii*) is the natural source of all the local human infection of Trichomonas. *Balantidium coli* and its pathogenic effects have been noticed.

Helminths.—The liver fluke is common among sheep only. Both the common tapeworms (*T. solium* and *saginata*) are common, as also are *Ascaris lumbricoides, Oxyuris vermicularis,* and *Strongyloides stercoralis.* Hookworms do not exist in Arequipa, nor does Trichocephalus. (Belascaris has been found in cats, and Toxascaris in a dog).

Arthropoda.—Demodex, the ordinary itch-mite and an itch-mite from the lama, *Ornithodorus megninii* and *Argas persicus* all attack man in Arequipa, as do all the three species of lice and *Cimex lectularius.* Fleas are not obtrusive in this dry climate. (The only case of plague seen by the author was remarkably benign; it was, however, traced to a dead body of a local rat). The only mosquito in the vicinity of Arequipa is *Culex escomeli.* One species of Simulium (*S. escomeli*) and one gadfly (*Tabanus fulvipes*) are troublesome.

Parasitic Fungi.—These would seem to be not common. The author mentions *Discomyces minutissimus* (1 case), *Actinomyces bovis* (3), *Trichophyton tonsurans* (in some children) and *T. mentagrophytes* (1), *Trichosporum giganteum* (1), *Monilia albicans* (frequent) and *M. vaginalis, Malassezzia furfur* (2), *Pityrosporum ovale, Rhinocladium beurmanni* (3), and *Penicillium* sp. (causing a maculation of the skin known as "Ccara" or "Mancha").

A. A.

WITHERSPOON (J. A.) & WITHERSPOON (Jack). **A Survey of the Intestinal Parasites found in the Territory supplied by St. Thomas Hospital, Nashville, Tennessee.**—*Southern Med. Jl.* 1924. Sept. Vol. 17. No. 9. pp. 669–672.

A uniform routine examination of stools of all suitable patients, on admission, was carried out for a term of four months—January–April. Evidence of parasites was found in 19 per cent. of 375 suitable stools, " pathogenic amoebae " occurring in 12·8 per cent. The list of parasites is as follows: " Amoeba," Chilomastix, Trichomonas, Giardia, Strongyloides, Dwarf tapeworm, Whipworm, Hookworm, Roundworm.

A. A.

FAUST (Ernest Carroll). **Observations on North China Intestinal Parasites of Man based on an Intensive Examination of Patients in a Medical Ward of the Peking Union Medical College Hospital.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp 411–437. [6 refs.]

This is a close and critical study, by a rigorous technique, of 60 cases of patients of the poorer classes, suffering mainly but not necessarily from intestinal disease, in a ward of the Peking Union Medical College Hospital, undertaken to determine the intestinal parasites implicated in the diseases of northern China, and it involved the scrutiny of 1,409 stools. The results are presented largely in the form of statistical tables, the first of which gives the record, for each individual case, of the number of stools examined, the number of days under observation, the preliminary clinical diagnosis, the final primary diagnosis, the secondary diagnosis after examination of stools, the treatment and its results, and the specific intestinal parasites detected. In two cases the primary diagnosis was entirely changed on the results of the microscopic examination.

Of the 60 patients 48 were " positive " for intestinal parasites: 27 had protozoon infestations (12 protozoon only), and 36 helminth infestations (21 helminth only), (and 15 both together therefore). Of protozoa *Entamoeba histolytica* was present in 12, *Caudamoeba sinensis* in 4, *E. coli* in 12, *Iodamoeba buetschlii* in 2, *Trichomonas hominis* in 10, *Giardia lamblia* in 2, *Embadomonas sinensis* in 8, *Chilomastix mesnili* in 5, Bodo (?) in 6, *Cercomonas longicauda* in 1 ; the number of cases of amoebic dysentery was 13 and of *E. histolytica* carriers 1. Of helminths *Ascaris lumbricoides* was present in 24, Ancylostoma or Necator in 13, *Trichuris trichiura* in 8, *Oxyuris vermicularis* in 1, *Hymenolepis nana* in 4, *Taenia saginata* in 1, and *Dicrocoelium dendriticum* in 1.

As regards flagellate infestation " the entire clinical history in each case preponderates in favour of . . . . . an indication of an abnormal intestinal balance."

Improper disposal of nightsoil is the source of the common parasitic diseases in North China, and prevention appears to the author to be a simpler matter there than in other parts of the Orient. It must be mentioned that the results of the present survey are compared throughout with the results of the survey of human intestinal parasites in Central China carried out by the author and WASSELL (see *Bulletin* Vol. 19, p. 458).

A. A.

LE NOIR (P.) & DESCHIENS (R.). **Étude statistique concernant les infestations parasitaires du tube digestif à Paris.**—*Arch. des. Malad. de l'Appareil Digestif et de la Nutrition.* 1924. Apr. Vol. 14. No. 4. pp. 293–298.

This paper gives the statistics of serial studies in Paris of stools of 1,000 adult males suffering from gastric or entero-colitic trouble of some sort.

The animal parasites [among which Blastocystis is included] discovered are classified as follows, in percentages of cases: (1) Species definitely pathogenic; *Entamoeba dysenteriae* 5·0, *Giardia intestinalis* 7·5, *Taenia solium* 0·5, *T. saginata* 1·5, *Dibothriocephalus latus* 0·5, *Ascaris lumbricoides* 1·0, *Oxyuris vermicularis* 1·0, *Ancylostoma duodenale* 0·1. (2) Species ordinarily little pathogenic: *Trichocephalus trichiurus* 20·0 (in association with *E. coli* in 50 per cent. of the instances). (3) Species doubtfully pathogenic: *Chilomastix mesnili* 0·2, *Trichomonas intestinalis* 0·3. (4) Non-pathogenic species: *Entamoeba coli* 30·5 (in association with other species in 80 per cent. of the instances), *Endolimax nana* 0·5, *Blastocystis hominis* 15·0 (in association with *E. coli* in 66 per cent. of the instances).

Thus definitely pathogenic species were present in 17·1 per cent. of the stools. The infestations with Ascaris and Oxyuris are regarded as abnormally low. The infestations with Giardia and *Entamoeba dysenteriae* (=*histolytica*) were in patients having a "colonial" history in 4 and 70 per cent. of the instances, respectively. The infestation with hookworm was autochthonous. The character of the stools associated with the different parasites is described, and the fluctuating nature of the pathological reactions to the parasites, particularly to the Protozoa, is commented on.

A. A.

SMITH (A. Malins). **The Spread and Incidence of Protozoal Infections in the Population of this Country.**—*Brit. Med. Jl.* 1924. Nov. 15. pp. 897–898. [7 refs.]

Some of the original observations of Malins Smith and his collaborators (see this *Bulletin*, Vol. 9, p. 445, and Vol. 11, p. 47), observations that have enlightened the eyes of the medical profession to the world-wide significance of *Entamoeba histolytica*, and in their re-echoed confirmation have played a part in clarifying our ideas of "tropical disease," are here re-stated in the hope that they may have their full effect upon home-staying sanitarians.

A. A.

BACH (F. W.). **Weitere Untersuchungen ueber die Verbreitung parasitischer Darmprotozoenarten des Menschen innerhalb Deutschlands.** [The Distribution of Intestinal Protozoa of Man in Germany.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Oct. Vol. 28. No. 10. pp. 428–443. [20 refs.]

Of 435 individuals (214 adult, 221 under 15 years) examined in the Rhine province 37 per cent. were infested with intestinal protozoa. The species observed were, in percentage, *Entamoeba coli*, 23·2; *E. histolytica*, 3·9; *E. hartmanni*, 2·1; *Endolimax nana*, 7·8; *Iodamoeba buetschlii*, 4·8; *Giardia intestinalis*, 14·9; *Chilomastix mesnili*, 1.4.

A. A.

Kitaew (F.) & Ioff (I.). **Zur Parasitologie und Klinik multipler Protozoeninfektion.**—*Rev. Microbiol et Epidémiol.* Saratov. 1924. Vol. 3. No. 1–2. In Russian pp. 69–74. [13 refs.]. German summary pp. 105–107.

Short account of a patient in the clinic at Saratov (S.E. Russia) who, with all three species of malaria parasites in his blood, was also for one concurrent month suffering from a dysentery relapse and passing active *Entamoeba histolytica* in his stools (as well as *E. coli*, Trichomonas, Giardia and Blastocystis), and yet during the 2½ months that he was under observation kept a temperature that may be regarded as normal, since it only occasionally rose (in the evening) to 98·9° or 99·5° Fahr.

A. A.

Faust (Ernest Carroll). **Anomalies found in Fecal Examinations in China.**—*China Med. Jl.* 1924. Oct. Vol. 38. No. 10. pp. 820–824.

This paper emphasizes the everlasting truth that a man cannot examine stools microscopically for diagnostic purposes until he has become familiarized with the distractions and delusions inherent in simple faecal matter magnified. Apart from air-bubbles and droplets of oil and an infinite variety of undigested and partially digested animal and vegetable tissue-elements, and apart also from living protozoa and other kinds of animalcules introduced in diluents, there may occur objects that puzzle even the practised eye, particularly in the faeces of people of unconventional tastes and habits. Among things of this last category the author from his extensive experience mentions myxosporidia, probably from infected fish ; segmenting and embryon eggs of the edible snail Viviparus, from a man who had been eating the snails ; nematode worms (Mermis) from uncooked cabbage, and Gordiid worms from grasshoppers and crickets (delicacies among certain races); eggs of flies. He also reminds the reader of the coprozoic protozoa, and of red blood cells which may indicate merely a congestion of the haemorrhoidal vessels.

A. A.

Jacobs (Walter A.). **Certain Aspects of the Chemotherapy of Protozoan and Bacterial Infections.**—*Medicine.* Baltimore. 1924. May. Vol. 3. No. 2. pp. 165–193. [38 refs.]

This instructive paper covers much the same ground as Dale's lecture (see below, pp. **326–328**).

The early attempts to kill bacteria in the living host with chemical agents that are strongly germicidal *in vitro* led to the conclusion that therapeutic disinfection is impossible ; the toxic affinity was found to be greater for the animal tissues than for the bacteria. Even with later synthetic drugs, few kept their bactericidal powers in the presence of serum. Optochin, however, is at last one good instance of a synthetic compound that can exercise bactericidal powers *in vivo.*

Even in the case of optochin its inhibitive action on the pneumococcus was at first supposed to be direct ; but the observation that a small dose of optochin in oil, which was itself quite ineffective against an experimental pneumococcus-septicaemia in the mouse, was capable, when employed in concurrence with a quantity of homologous anti-pneumococcus serum also far below the effective dose, of increasing the threshold value of the serum at least fifty times, suggests something more than a direct bactericidal action; it points to some biological co-operation in the therapeutic process.

The chemotherapy of protozoon infections is next considered--the nature and some of the activities of trypan red, trypan blue, Bayer 205, and of the arsenical derivatives atoxyl, salvarsan, and tryparsamide, showing how they all " by indirections find directions out." In the case of tryparsamide " there seems every reason to attribute its efficacy [in trypanosomiasis] not only to its powerful stimulating action on the animal economy and on the animal resistance, but to its great tissue penetrability and to its affinity for the tissues of the central nervous system which are involved in the more advanced stages of the human disease. This property has been demonstrated again in the behaviour of the drug in certain types of neurosyphilis."

A. A.

CLELAND (J. Burton). **Injuries and Diseases in Australia attributable to Animals (except Insects).**—*Med. Jl. Australia.* 1924. Oct. 4. 11th Year. Vol. 2. No. 14. pp. 339–345. [33 refs.]

This is a very comprehensive collection of Australian observations and records of accidents and injuries, mostly of an unusual though not elsewhere unmatched kind, caused by animals outside the notoriously venomous orders of snakes and insects. It is curiously and generally interesting, and has much value as a zoologically-classified record. The author notes that BACKHOUSE seems to have been the first, in 1836, to describe tick-bite paralysis.

A. A.

BYRNE (Kevin). **Injuries and Diseases in Australia attributable to Animals.** [Correspondence.]—*Med. Jl. Australia.* 1924. Nov. 15. Year 11. Vol. 2. No. 20. p. 539.

The writer draws attention to red ants, the stone-fish (*Synanceia horrida*), crocodiles, turtles, and sea-snakes as additions to Dr. CLELAND'S list of noxious animals of Australia. (See above.)

A. A.

PARADICE (W. E. J.). **Injuries and Lesions caused by the Bites of Animals and Insects.**—*Med. Jl. Australia.* 1924. Dec. 20. 11th Year. Vol. 2. No. 25. pp. 650–652. With 2 text figs.

An interesting confirmation, from the author's own experience, of a chapter of accidents familiar to those who, in the tropics, have participated in the sequestered but fascinating calling of marine surveyor. The author mentions the bites of aggressive eels; poisoning from the flesh of the parrot-fish (Tetrodon) and—in certain circumstances—from a perciform fish known in Australia as " Chinaman "; wounds from the envenomed spines of sting-ray, dog-fish, and the cat-fish Plotosus; urtication and inflammation from setae of Eunicid worms and spines of sea-urchins, from cuts and scratches by living coral, and from the slime of jelly-fish.

A. A.

GRÜBEL (Erich). **Spezifische Hautreaktion bei Impfungen mit Extrakten von menschlichen Parasiten (Oxyuren, Läuse usw.).** [Specific Skin Reaction to Injections of Extracts of Human Parasites (Oxyuris, Lice, etc.).]—*Dermat. Woch.* 1924. Oct. 4. Vol. 79. No. 40. p. 1182.

If a saline emulsion—or a filtered extract, even if heated to boiling-point—of a threadworm or a crablouse be injected into an individual infested with either of those parasites, respectively, there follows in five minutes, at the site of the injection, a progressive itching and an obvious rash (Quaddelbildung). No such reaction occurs in the uninfested individual. Further critically definitive experiments are to be undertaken; at present the author merely emphasizes the specific reaction to an existing infestation, states that it is most outright in the case of threadworm, and that in the case of crablouse it is not elicited a few days after the parasites have been got rid of. Thirty-five experiments were made altogether.

A. A.

KOFOID (Charles A.), SWEZY (Olive) & KESSEL (John F.). **On the Distinctions between** *Endamoeba coli* **and** *Councilmania lafleuri*.—*Univ. California Public. Zool.* 1924. Jan. 31. Vol. 26. No. 3. pp. 21–39. With 24 figs. [6 refs.]

The following is the authors' summary of this their reply to WENYON's criticism (*Bulletin*, Vol. 19, p. 19) of the nature and relations of *Councilmania lafleuri.*

"The conclusion of WENYON's review is that 'the amoeba *C. lafleuri* is none other than *Entamoeba coli.*' The following facts controvert this conclusion: (1) The case reported in our first paper had been clinically cured of an infection by *E. dysenteriae* and thereafter had motile amoebae with clear pseudopodia and cysts of *Councilmania,* but none of *E. dysenteriae* in 113 examinations. (2) Cases in which only *C. lafleuri* was detected exhibit motile stages with clear pseudopodia only, while some of the attendant cysts appear with chromophile ridges, pores, buds, variable numbers of nuclei whose central karyosomes are dispersed, and with eight chromosomes at mitosis. These characteristics are persistent in cases of infection continuously examined. (3) Cases in which only *E. coli* was detected present motile stages with granular pseudopodia only, and the attendant cysts do not have chromophile ridges, pores, or buds. The karyosomes are excentric, small and solid, and the chromosomes are six in number. These characteristics are persistent when tested. (4) Mixed infections present both types. (5) These characteristics remain as stated on transfer to rats in cases of single and mixed infections." [See below, p. 333.]

A. A.

STRONG (Richard P.). **Investigations upon Flagellate Infections.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp. 345–385. With 6 plates. [36 refs.]

The author's own summary and conclusions are as follows:—

"In studying certain infectious diseases of plants and in searching for animal parasites in the latex of various tropical plants in Central and South America, a flagellate parasite was discovered in three species of *Euphorbiae.* This flagellate is of the leptomonas type and is not dis-similar in appearance to the flagellate stage of *Leishmania tropica* giving rise to a form of tropical ulceration of the skin. In one district in Panama a very extensive phytodemic of the infection in *Euphorbiae* was found to exist. These plants were very abundant in this region and almost every one was found infected. The infected plants showed pathological changes, and the latex of the plant was also distinctly altered—the flagellates causing disturbances in the circulation of the plant, sometimes forming emboli in the lactiferous channels. The nutrition of the plant was thereby distinctly disturbed and many of the plants became atrophied.

"The insect *Chariesterus cuspidatus* transmitting the infection from the plant to a species of lizard *Cnemidophorus lemniscatus* was also discovered. From extensive experiments upon animals it was demonstrated that the flagellate as it occurs in the plant, and also in the intestinal tract of the insect, is not pathogenic for vertebrates. However, after the flagellate has passed through the insect to the lizard, it acquires pathogenic properties and may give rise to a form of tropical ulceration in the skin, as was demonstrated from experiments in the monkey. In this ulceration the leishmania form of the parasite and not the flagellate stage is encountered.

"There is perhaps nothing very extraordinary in the idea that a flagellate found producing a disease in plants may after passing through an invertebrate and a vertebrate host, acquire pathogenic properties for a mammal. This apparently is the first instance of this nature in which such a chain of infections has been demonstrated."

The records of the experiments appear in full in reprints of the article.

A. A.

YAMASAKI (Shigeru). **Ueber** *Leptomonas ctenocephali*, *Trypanosoma lewisi* **und pathogene Trypanosomenarten im Hundefloh.** [*Leptomonas ctenocephali*, *Trypanosoma lewisi* and Pathogenic Trypanosomes in the Dog-Flea.]—*Arch. f. Protistenk.* 1924. June 6. Vol. 48. No. 1. pp. 136–179. With 1 plate & 5 text figs. [45 refs.]

From careful comparison of natural and cultural forms of *Leptomonas ctenocephali* with cultural forms of *Leishmania donovani* the author is convinced of their individual specific distinctness; moreover, mice and puppies cannot be infected experimentally with the Leptomonas of the flea.

With regard to *Trypanosoma lewisi*, the author finds that the rat is as infective to the rat-flea in the chronic stage, when few or no trypanosomes can be detected in the blood, as it is in the acute stage; also that the flea can impart the infection by its bite, as well as by the usual faecal route; and also that an intracellular proliferation in the epithelium of the flea's gut is not a necessary preliminary of the development of the trypanosome in that insect.

In the author's experiments *Schizotrypanum cruzi* (33 expts.), *Trypanosoma brucei* (14), *T. equinum* (21), *T. equiperdum* (25), and *T. evansi* (14) were not transmissible to fleas, though the specific trypanosomes retained life in the fleas' gut for 45 minutes, 90 minutes, 3 hours, 5 hours, and 4 hours, respectively. This tenacity of life under inhospitable conditions is regarded by the author as an argument in favour of mechanical transmission of trypanosome infection among vertebrate hosts.

A. A.

LLOYD (Ll.). **Note on the Occurrence of a Herpetomonad in** *Glossina morsitans.*—*Bull. Entom. Res.* 1924. Nov. Vol. 15. Part 2. pp. 185–186. With 1 fig. [1 ref.]

Description and figures of a herpetomonad discovered in three individuals of *Glossina morsitans* in N. Nigeria, in one instance concurrent with *Trypanosoma vivax.* The herpetomonad, which is distinguished by an unusually large kinetonucleus, was found in the proboscis and midgut, but not in the salivary glands; among the many individuals observed two possessed an undulating membrane, and some of those in the gut had no flagellum or only a rudiment of one.

A. A.

ROSS (W. C.), assisted by HUSSAIN (Mahomed). **On the Life History of** *Herpetomonas muscae domesticae.* **A Preliminary Note.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 614–615.

In a startling " preliminary " flash a life-history of the herpetomonas of the housefly is here very briefly disclosed. The parasite is said to enter the fly in the form of a minute spore, which passes through the intestinal wall into the underlying tissues, where, in the course usually of 3 days, it "divides by fission, multiplies, and grows to maturity." The mature flagellates then pass back into the lumen of the intestine, where they precipitately enter into a process of sexual conjugation, which is followed by division of the macronucleus culminating in the issue of a number of minute spores. These, which constitute the infective stage, are found in great numbers in the fly's gut. The flagellates do not long survive this reproductive process. The authors have never observed fission of the flagellates, though the act of conjugation, and sometimes also the rapid motion of the flagellum, may give rise to the appearance of fission. The authors have observed all the stages mentioned in the above account of *H. muscae domesticae* in cultures of the kala azar parasite also.

A. A.

BOECK (William C.). **Studies on** *Tricercomonas intestinalis* **(Wenyon and O'Connor, 1917).**—*Amer. Jl. Trop. Med.* 1924. Nov. Vol. 4. No. 6. pp. 519–535. With 12 figs. [16 refs.]

Tricercomonas intestinalis, originally discovered (and described) by WENYON and O'CONNOR in men of the Egyptian Expeditionary Forces, is here described in minute detail, well figured in its active and encysted phases, and confirmed in its generic status.

A. A.

CHAGAS (Carlos). **Fécondation de la** *Prowazekia cruzi.*—*C.R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30. pp. 988–990. With 11 figs.

The author has been studying for some time the sexual reproduction of a free flagellate, *Prowazekia cruzi*, and here describes and figures several stages, the serial connexion and relations of which are to be explained, along with necessary complemental detail, in a forthcoming publication.

A. A.

HEGNER (Robert W.). **Giardia and Chilomastix from Monkeys, Giardia from the Wild Cat and Balantidium from the Sheep.**—*Jl. Parasit.* 1924. Dec. Vol. 11. No. 2. pp. 75–78. With 4 text figs. [3 refs.]

The author lists 12 described species of Giardia—from mammalian, avian, reptilian, and amphibian hosts—each being specific to the corresponding host so far as critical study has yet gone; he also assumes the existence of other species, one (from the wild cat) the encysted form of which is here figured and briefly described, its specific status having still to be determined, and another (from the S. American monkey *Ateles geoffroyi*) here similarly described and figured as a new species. Chilomastix cysts from the S. American monkey, *Cebus apella*, and a Balantidium from a sheep are also described and figured.

A. A.

GALLI-VALERIO (B.). **La lambliase.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessoes.) 1923. Aug. No. 4. pp. 447–459.

There is nothing novel in this paper. The author agrees that lambliasis is a morbid entity, chronic, and characterized by alternating diarrhoea and constipation, considers that rats and mice very probably contribute to its spread, thinks that at the moment the best treatment is salvarsan or some analogous compound, and recommends the ordinary sanitary prophylaxis.

A. A.

DE MELLO (Froilano) & DA SILVA (Francisco Venancio). **Première contribution à l'étude des flagellés de l'intestin des indigènes d'Angola.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessoes.) 1923. Aug. No. 4. pp. 475–485. With 3 plates. [7 refs.]

The flagellates here discussed and plentifully figured are *Chilomastix mesnili*, *Cercomonas longicauda*, and a species of Bodo— all from stools of natives of Angola.

A. A.

DESCHIENS (R.). **Variations tinctoriales et métabolisme de l'amidon chez Giardia.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 889–894. [5 refs.]

Several authors have described Giardia cysts staining blue with iodine solution, and the author has observed an instance of the same reaction in active forms of Giardia. In the present paper he gives particulars (1) of a find of blue-staining active forms in a cat whose jejunum contained starch in great abundance, and (2) of a find of active forms colouring yellow and cysts colouring rose-violet or lilac-violet with iodine solution in a case of chronic diarrhoea. Furthermore, cysts from this last find after keeping for three days stained the most part yellow with iodine solution. The author concludes therefore that Giardia certainly can convert dextrin into glycogen, and probably starch into dextrin.

A. A.

LEWIS (Paul A.). **The Inhibitory Effect of Acridine on the Sporogony of a Coccidium** (*Eimeria stiedae*).—*Jl. Experim. Med.* 1924. Aug. 1. Vol. 40. No. 2. pp. 263–267. [3 refs.]

Experimenting *in vitro* with various chemicals and drugs known to be noxious to Protozoa the author finds that the only one having a fairly constant inhibitory effect on the ripening of the oocyst of the Coccidium of the rabbit is acridine hydrochloride. In concentrations of 1 in 10,000 down to 1 in 80,000 development of nearly all unripe oocysts is entirely inhibited, and in concentrations of 1 in 100,000 to 1 in 1,000,000 it is obstructed. Occasionally, however, an individual cyst is found to develop normally, regardless of the concentration of acridine to which it is exposed. Moreover, if the oocysts have proceeded to the formation of sporoblasts, acridine has no effect upon their further development.

A. A.

ADIE (Helen). **The Sporogony of** *Haemoproteus columbae*.—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 605–612. With 5 text figs. & 2 plates. [4 refs.]

In face of some unintelligible expressions of doubt of her conclusions regarding the sporogony of *Haemoproteus columbae* in the Hippoboscid fly, *Lynchia maura*, published in the *Indian Journal of Medical Research* in 1915 (see this *Bulletin*, Vol. 6, p. 189), Mrs. Adie has re-investigated this subject in Dr. Edmond SERGENT's laboratory in the Pasteur Institute of Algiers, and here gives in full detail, with illustrations of the several stages of development, the complete confirmation of her original researches. She describes and figures the development of the ookinete and encysted vermicule in *Lynchia maura*, the various stages of the growing oocyst, the bursting sporocyst, and the free sporozoites, which last invade the fly's salivary glands from 10 to 12 days after an infective feed. Infected salivary glands of *Lynchia maura* injected subcutaneously into an imported and certified clean pigeon produced an infection of Haemoproteus parasites in the bird's peripheral blood 27 days later. Mrs. Adie's research was carried out under the direction and strict criticism of Dr. SERGENT, and no doubt can now remain about the fact that the praeter-vertebrate development of Haemoproteus is essentially similar to that of Plasmodium and Proteosoma.

A. A.

SHORTT (H. E.) & SWAMINATH (C. S.). **Note on** *Nosema adiei* **(Christophers, 1922).**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 181–183. With 1 plate. [3 refs.]

Description and coloured figures of *Nosema adiei*, the parasite once mistaken for an extra-corporeal form of the kala azar parasite. So far the authors have found it only in *Cimex hemiptera* (=*rotundatus*)—often enough to breed doubt and confusion, but not often enough to breed the indifference that follows familiarity. It has been recognized so far in the insect's gut, salivary glands, and ovaries, in three forms—spores, planonts, and meronts. Spores predominate (free and intracellular) and, when numerous, can be recognized in the fresh dissection, by refringency; they have average dimensions of 3μ by 1·7μ and stain (Romanowsky) pale blue with a central deeper blue, or red, dot; often they occur in clumps often along with one or more meronts. Planonts (not definitely intracellular) are the least numerous and are not distinguishable fresh; they are amoebules about 1·6μ in longest diameter and they stain blue or cobalt except for a relatively large excentric mass of chromatin. Meronts (free and intracellular) greatly vary in size, the average dimensions being 3·2μ by 2·7μ; they stain cobalt blue and have one or two large central or excentric masses of chromatin—never rod-like.

A. A.

OHI (Tsukasa). **On the Morphology, Development, and Reproduction of** *Balantidium coli* **Malmsten, and its Cyst.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa.*) 1924. July. No. 235. [In Japanese. With 2 plates. 21 refs.] English summary pp. 1–3.

This author has observed conjugation and multiplication by budding in *Balantidium coli*; the latter process is described as beginning with the macronucleus. He has also made observations of the remarkable resistance of Balantidium cysts: kept in faeces under cover at a temperature of 50° to 70° F. they remain alive for 1 to 1½ month; kept in moisture, for 2 months; left dry, in the shade, for 1 or 2 weeks; exposed to direct sunshine they die in 3 hours. The cysts resist a saturated [aqueous?] solution of $HgCl_2$ for an hour and a 5 per cent. solution of carbolic acid for 3 hours, gastric juice at 98·3° F. for 6 hours, bile for 15 days, and urine for 10 days. Some cysts will survive for 12 hours or more in a saturated solution of common salt.

A. A.

MACGREGOR (Malcolm E.). **Special Apparatus and Technique for the Study of Mosquitoes and other Aquatic Insects.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 388–397. With 7 text figs.

Some ingenious and useful devices are here described and explained in clear detail: as the making of nipples for pipettes, out of ordinary rubber-tubing; of catheter pipettes, for collecting tree-hole larvae; of creosote bottles for entomological storage boxes; and of "floating harbours" for keeping mosquito-eggs from getting stranded by evaporation. Some useful methods of fine technique are also happily described: as the management of experimentally-fed mosquitoes, and of individual larvae and pupae; methods of treating the infected stomach and of staining the wing; of killing mosquitoes in a good pose, and of mounting them; and of preserving larvae and pupae.

A. A.

MACGREGOR (Malcolm E.). **Tests with *Chara foetida* and *C. hispida* on the Development of Mosquito Larvae.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 382–387. [11 refs.]

The author gives a full account of some very careful experiments in growing *Chara foetida* and *hispida* in—or adding extract of Chara to—natural water in which mosquito larvae were kept, and he states that so far as any ill effects on Anopheles (*A. bifurcatus*) larvae are concerned his observations agree with those on other Anopheline larvae in an environment of *Chara robbinsii* recorded by BARBER (see *Bulletin* Vol. 21, p. 776). Some larvae of *Culex pipiens* certainly suffered from being kept merely in water in which Chara was growing, but the author reasonably attributes this to their being in an environment unnatural for the species. As a final conclusion he thinks it "certain that Chara can have no generally useful application in practical anti-mosquito measures."

The author emphasizes the proviso that in all experimental work on this subject fidelity to natural conditions should be observed—that the water in which the influence of living Chara (or Chara extract) is being studied should not only contain food for the mosquito larvae, but should also be of the proper pH temper; also incidentally that Chara extract should be free from contamination.

He records that *Anopheles bifurcatus* and *maculipennis*, *Culex pipiens*, and *Ochlerotatus nemorosus*, placed in large cages each of which contained a bowl of water and Chara and a bowl of water and stalks of grass, all dropped their eggs indifferently in either bowl.

A. A.

HAWORTH (W. E.). **Mosquitoes and Coconut Palms. A Mosquito Survey of Palm Trees in East Africa and the Problems resulting therefrom. With an Appendix describing Two New Species of Mosquitoes from Coconut Palms in East Africa.** By EDWARDS (F. W.).—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 162 198. With 3 charts & 4 plates.

A very complete account of a laborious and very careful survey already mentioned in this *Bulletin* (Vol. 20, p. 792). The survey, which was continued for more than 2 years and 8 months, was concentrated around ten different stations—chiefly township areas—distributed along the coastal tracts of Kenya Colony and Tanganyika territory and the adjacent islands. Altogether 10,382 palms were examined, and collections of living mosquito larvae and pupae were discovered in 7,747 of them -in water collected in the axils of the leaves -at all seasons of the year, even in times of comparative drought. The number of species of mosquitoes identified was 28. Among these species *Anopheles costalis* occurred in 57 collections, *A. pretoriensis* in 1, *Aëdes argenteus* (=*Stegomyia fasciata*) in 3,802, and *Culex fatigans* in 2,354. The larvivorous larvae of *Megarhinus brevipalpis* occurred in 62 collections, and of *Lutzia tigripes* in 134. The estimated heights of palms yielding larvae and pupae ranged from 10 to 70 feet. The sources of the water were not conclusively settled; rain certainly was not the only source; after careful observation and consideration the author thinks that it may sometimes have come from dew, and possibly from leakage of crude sap from injuries inflicted by insects. The water supports a varied fauna besides mosquito larvae: the forms identified include larvae of Psychodidae (Pericoma and Psychoda); Chironomidae (Dasyhelea, Culicoides, and Chironomus); Drosophila; Apiochaeta (Phoridae); and Eristalis (Syrphidae); also 3 species of beetle larvae, including Dytiscidae and Hydrophilidae; not to mention some possibly accidental and temporary inhabitants.

A. A.

RIPLEY (L. B.). **Sodium Fluoride as an Insecticide: its Possibilities as a Locust Poison.**—*Bull. Entom. Res.* 1924. Aug. Vol. 15. Pt. 1. pp. 29–34.

Sodium fluoride is effective against cockroaches and earwigs, and, as the present author here shows, against locusts; in these instances it acts through the stomach. But apparently it can also act through the breathing-orifices of some insects, as a "contact" poison, since it has been used with success for killing bird-lice (Mallophaga). [It may therefore have useful applications, to be determined by experiment, in medical entomology.] It has the two great advantages of cheapness and comparative safety, for although 15 grains are reported to have killed a 20 lb. dog, the animal held out for four days. At any rate, it is not classed as a poison and is an important ingredient (being an ovary irritant) of certain poultry-spices in general use. Sodium fluoride is in the main a by-product of the aluminium industry. Its chief source is cryolite, one of the principal aluminium ores, from which it is dissolved out by treatment with caustic soda. It is sold in the form of a white powder.

A. A.

ANDERSON (T. J.). **Bloodsucking Insects and their Allies in the Colony and Protectorate of Kenya.**—*Kenya Med. Jl.* (Supplement). 1924. Aug. Vol. 1. No. 5. 14 pp.

The species of blood-sucking flies of all sorts, fleas, bed-bugs, blood-sucking lice, biting lice (Mallophaga) and ticks at present known to occur in the Colony and Protectorate of Kenya are here listed—along with the localities where they have, severally, been reported—in systematic zoological array. The catalogue fills nearly 12 pages.

A. A.

COOLING (L. E.). **The Larval Stages and Biology of the Commoner Species of Australian Mosquitoes, with the Biology of** *Aëdes pecuniosus* **Edwards.**—*Commonwealth of Australia Dept. of Health Service Publication (Tropical Division No.* 8. 1924. 40 pp. With 1 plate & 15 figs. [12 refs.]

In this useful paper are adequately described, along with good figures of their characteristic parts and with ample details of their breeding-places, habits, and biology, the larvae of 11 species of Australian Culicidae, and among them *Aëdes aegypti* (=*Stegomyia fasciata*) and the closely similar *Aë. notoscriptus.* The following instance of the tenacity of *Stegomyia fasciata* is worth quoting :—

> "A new earthenware pitcher was recently bought from a pottery The pitcher, which had never contained water before, was filled with rain-water, which had been boiled and allowed to cool ; the spout was netted, but not the lid, which contained a small thumb-nick.* Seven or eight days afterwards fully-grown larvae of *Aëdes aegypti* were noticed. The water was emptied out entirely and filled up several times with a strong jet of water ; the water was emptied out vigorously after each of the fillings. The pitcher was then filled with clean water and netted with fine cloth gauze on the spout and top, the net being secured by elastic bands ; a couple of days afterwards young larvae in the second instar were noticed. The pitcher was again emptied and swilled out more thoroughly than before. Filled up with clean water for a second time and again effectively screened against mosquitoes, the same species of larvae was noticed again after the third day. A third treatment produced the same results ; but it is interesting to note that after each treatment the number of larvae noticed was progressively less. From the time of the first treatment and mosquito-proofing to the present—*i.e.*, the last washing of the pitcher—about four weeks have elapsed."

A. A.

RUDOLFS (Willem). **Mosquito Breeding in Specific Places.**—*Jl. Parasit.* 1924. Dec. Vol. 11. No. 2. pp. 79–83. [1 ref.]

The main conclusions from the careful experiments here summarized are that acidity of water, as such, does not affect mosquito breeding ; that the food supply for larvae, which might be dependent on the chemical composition of the water, is the main determining factor ; and that high amounts of toxic aluminum and iron sulphates in waters from clay-pits are inhibitive.

A. A.

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* This nick is at the perimeter ; after it passes one of the two diametrically opposed thumb-like protuberances immediately over the counterbore, the lid is slightly rotated so that tilting of the vessel will not dislodge the lid.

FRANÇA (Carlos). **L'emploi des plantes dans le combat des moustiques.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a, e 5a. Sessoes.) 1923. Aug. No. 4. pp. 419–422.

The author advocates the employment of suitable aquatic plants in anti-mosquito measures and mentions the names of some of the species that have been recommended for this purpose. He mentions with particular approval Azolla, which effectually prevents mosquitoes from breeding where it forms an unbroken mat over the water, and *Utricularia vulgaris*, which he himself has observed trapping a large number of larvae of *Anopheles bifurcatus* and *Theobaldia spathipalpis*.

A. A.

CARTER (H. R.). **Preferential and Compulsory Breeding Places of** *Aedes* (*Stegomyia*) *aegypti* **and their Limits.**—*Ann Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 493–503. Also *Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 228–238. [Published by United Fruit Company, Boston, Mass.]

"We must speak by the card or equivocation will undo us." The author having expressed his wide American experience of the matter in the following formula : "We have not found this mosquito (*Aëdes* (*Stegomyia*) *aegypti*) breeding, in nature, completely, that is, from oviposition to imago, in any collection of water, all the sides of which at the water's edge were of mud," now has to restrict his predicate by the qualifying addition of the words "in the Americas." For two observers in the Gold Coast of West Africa discovered *Aëdes* (*Stegomyia*) *aegypti* breeding in company with *Culex fatigans*, and with complete and formidable success, in water collected in footprints in the mud of a lagoon. This discovery has led him to re-examine his original proposition most carefully and to confirm it as qualified and restricted. It has also induced him to publish here some useful and salutary reflections on compulsory breeding-places and their limits.

A. A.

BRUG (S. L.). **De voornaamste Ned. Indische culicinen.**—*Vereen. tot Bevordering der Geneesk. Wetenschappen in Nederl.-Indië.* 1924. Nov. 53 pp. With 18 text-figs.

A good account—limited to the single tribe—of the Culicini of the Dutch East Indies. Following a table for discrimination of species, each species is succinctly described, in male and female, and its breeding-places and geographical distribution indicated.

A. A.

EDWARDS (F. W.). **Mosquito Notes.—V.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt. 3. pp. 257–270.

The following items are worthy of note here :—

Anopheles punctulatus, *Aëdes* (*Stegomyia*) *variegatus* (=*pseudo-scutellaris*) and *argenteus* (=*Stegomyia fasciata*) and *Culex fatigans* occur in the Solomon Islands, and *Aëdes* (*Stegomyia*) *albolineatus* (=*Stegomyia scutellaris*) in the neighbouring island of New Ireland.

A. A.

SWELLENGREBEL (N. H.). **Over de dichtheid der anopheles-bevolking om Amsterdam in de afgeloopen vier jaren.** [On the Density of the Anopheline Population around Amsterdam during the Last Four Years.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 30. Vol. 68. 2nd Half. No. 9. pp. 1113–1125. With 4 charts in text. [5 refs.]

The author has tried to find out whether the destroying of hibernating Anophelines around Amsterdam, combined with other measures (especially destruction of larvae), has resulted in a reduction of the numbers of Anophelines in houses and stables, and whether there is a correlation between the changes in these numbers and the changes in the malaria-rate in some villages in the districts under observation where this rate was accurately known. The numbers of Anophelines present was measured by those caught in houses or stables (recorded separately), expressed as an average number caught per house and per stable in each month. (The largest numbers are found in the autumn, sometimes also in January and February. Then the number diminishes in March-May, to rise again till autumn.)

It was not everywhere possible to demonstrate in this way a lasting reduction in the number of Anophelines. There was some reduction in 1922, but this did not continue in 1923. At the same time malaria, which in some villages had been most prevalent in 1920, in others in 1922, dropped to very low figures in 1923. In some portion of the district, however, a marked and lasting reduction had been obtained under the necessary restriction; this is ascribed to the measures taken.

It was observed that the fertility of the females (the percentage carrying mature ova) had been greatly reduced in 1923, in consequence of which the reduction of the number of anophelines, said to have occurred by some observers (but not apparent in the figures at the author's disposal), might be due as much to this natural phenomenon as to the measures taken. In the region where a more permanent reduction had been obtained with certainty this result had been obtained before this marked fall in the fertility and could not be explained by it.

The author concludes that, notwithstanding this partial result, the campaign still partakes too much of the nature of an experiment to recommend its adoption in other countries similarly situated.

N. H. Swellengrebel.

SWELLENGREBEL (N. H.). **Nog een opmerking over de dichtheid der Anophelinen bevolking om Amsterdam.** [Further Remarks on the Density of the Anopheline Population around Amsterdam.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Dec. 20. Vol. 68. 2nd Half. No. 25. pp. 3120–3124. With 3 charts in text.

The writer's paper showing no apparent permanent reduction in the Anopheline population around Amsterdam after some years of continuous destruction of adults in stables and houses has been criticized. Also his remark that there is no apparent correlation between the temporary Anopheline reduction in 1922 and the decline of the malaria-rate. It is asserted that the rise in the number of Anophelines found in houses in 1923 was an artificial one, since from April of that year the catches were made only in houses where Anophelines were known to occur in sufficiently obvious numbers.

In this paper the writer shows that the malaria rate went down in 1921 in Nieuwendam and in 1923 in Sloten, and that the Anophelines showed a temporary reduction in 1922. Furthermore, that even when particular houses that have been examined are taken at more or less regular intervals into consideration no proof can be gained of a reduction of the Anopheline population. He therefore cannot alter his opinion, but he grants that a reduction may have occurred, though its existence cannot be demonstrated. It has not been his intention to discourage in any way the present attempts to destroy Anophelines, which ultimately may prove to have been highly useful, if only as an experiment on a large scale.

N. H. Swellengrebel.

Swellengrebel (N. H.). **Over de pogingen tot vernietiging der larven van** *A. maculipennis.* [On Endeavours to destroy Larvae of *A. maculipennis.*]—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 27. Vol. 68. 2nd Half. No. 13. pp. 1576–1591. With 1 chart. [15 refs.]

Around Amsterdam the breeding-places of *A. maculipennis* are found in the numerous ditches of the " polders " surrounding the town. They cannot be filled in because they are necessary for the drainage of the land (1–4 metres below the level of the sea) ; nor be treated in the ordinary way, because cattle drink the water and the peasants are afraid that the milk will acquire a disagreeable flavour. They have been dealt with by oiling with neutral and inodorous liquid paraffin, in quantities of 3 cc. per square metre of water-surface. The larvae are killed not by any chemical action, but by the tracheae being filled with paraffin, even into their minute ramifications, by aspiration through the spiracles. If once this aspiration has taken place, the larvae die, even if they do not remain under the paraffin covering. Consequently, this cover need not be continuous. To estimate the influence of the oiling on the Anopheline population, the percentage of the males (" male census ") has been determined in the two years preceding action (1920 and 1921) and during it (1922 and 1923), on the assumption that if the oiling reduces the number of newly hatched mosquitoes this must become apparent by the reduced number of the short-lived males, even before the longer living females begin to diminish in numbers. It has been found that oiling coincided with a marked change in the curve of the half-monthly male-census. In 1920 and 1921 this curve showed three peaks in June, July and August ; in 1922 (first year of oiling) the middle peak had disappeared and the male-census had been reduced in comparison to 1921. In 1922 the oiling had been performed only where larvae were found. In 1923, to prevent the first hatching, apparent by the first male-peak, oiling had been done everywhere. This, however, had a contrary effect, owing probably to the more extensive surface to be oiled diminishing the thoroughness by which the work was done. [In 1924 the first method has again been adopted, and now it has been possible to take away both the middle and terminal top of the curve.—Sw.]

In laboratory experiments it was found impossible to prevent larval development by the action of *Chara foetida.*

N. H. Swellengrebel.

KLIGLER (I. J.). **Flight of Anopheles Mosquitoes.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 199–202.

In the author's experience the most accurate method of determining the distance of flight of Anopheles is by observations of given species at known distances from accurately surveyed breeding-places. Though apparently less, it is really more accurate than the method of tracing the flight of insects that are released after suffering all the manipulation involved in staining. By the first method the author, in Palestine, has satisfied himself that *Anopheles elutus* [=*maculipennis*], a common house-haunting species, can travel in considerable numbers from 4·5 to 5 kilometres, and that *A. superpictus* and *sergenti* and *multicolor*—also house-haunters—usually travel 2 km.

A. A.

NIKOLSKY (V. V.). **Observations on the Ability of Larvae of** *Anopheles maculipennis*, **Mg., to Crawl.**—*Bull. Entom. Res.* 1924. Nov. Vol. 15. Part 2. pp. 177–178. [2 refs.]

Larvae of *Anopheles maculipennis* have been observed by the author, in the Moscow district, to be able to crawl in all stages of their growth. The utility of this power must tell " in the preservation of the species ; but is somewhat limited, since only relatively small distances can be covered, and that only on very damp soil." One larva was observed to travel, with occasional stoppages, 75 cm. under natural conditions ; and another, in the laboratory, 106 cm.

The author has also observed adult *Anopheles maculipennis* emerging from pupae simply lying amongst débris on moist soil.

[Dr. F. W. O'CONNOR, in Samoa, frequently observed larvae of *Finlaya kochi* creeping like caterpillars on the leaf-stalks of the taro.]

A. A.

LEGENDRE (J.). **L'anophélisme à Lataquié.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 653–657. [3 refs.]

In the sea-coast town of Latakia, in Syria, the only species of Anopheles discovered by the author in 7 months was *bifurcatus*—the larvae being found in the domiciliary cisterns and the adults occasionally in the house. Having discovered the existence of a species that transmits the parasites, the author searched for indications of malarial fever, but found only one autochthonous case, a European. Among the native school children examined (270) only 4 were found to have an enlarged spleen, and only one of these had lived all his life in Latakia.

A. A.

i. IYENGAR (M. O. T.). **On the Indian Anophelines of the** *Funestus* **Group and the Description of a New Species (Diptera, Culicidae).**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 23–29. With 1 plate & 2 text figs. [4 refs.]

ii. STRICKLAND (C.). **The Anophelines** *funestus, minimus,* **and** *aconitus,* **including a Description of the Larva of** *minimus.*—*Ibid.* pp. 145–152. With 2 plates. [11 refs.]

i. With regard to Anopheles of the *funestus* " group " Iyengar tabulates and figures the minute differences between *listoni* [=*funestus*],

minimus, and a " new species," *varuna*, common in Bengal and other parts of India, having " characters intermediate between *listoni* and *minimus*." He leaves *aconitus* as a variety of *minimus*.

ii. Strickland, however, gives good reasons—potent among which is the fact that the two forms are identical in the larva and pupa stages —for regarding *minimus* as merely another name for *funestus* (=*listoni*) ; but he insists on the specific distinctness of *aconitus* on the ground that its larva has distinctive characters of its own. Strickland's general proposition that where two adult-forms of mosquitoes are indistinguishable throughout their larval stages they should be ranked as varieties of a single species is very sound.

A. A.

CHRISTOPHERS (S. R.). **Some Himalayan and Peninsular Varieties of Indian Species of Anopheles.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 11–13.

This paper deals considerably with the geographical distribution of *Anopheles gigas* and *A. lindesayi*, both of which are found in the Himalayas and the mountains of southern India—the former also in Ceylon, Java and Formosa—but not anywhere else, a distribution which is here—as it has been before, and elsewhere—described as " peculiar." [It seems therefore advisable to draw attention to the fact that this remarkable geographical distribution—so wide, yet so distantly localized—so far from being peculiar to these two mosquitoes, is strikingly exemplified in other groups of animals, both vertebrate and invertebrate, and has frequently been discussed by zoologists. A. R. WALLACE in the chapter on the Oriental Region, in his classical *Geographical Distribution of Animals*, describes, as one of the main features of its Ceylon and South Indian Sub-region, the existence here of numerous animals allied to forms only found again in the Himalayas or in the Malayan Sub-region (where Java is included). W. T. BLANFORD also, in his memoir on the *Distribution of Vertebrate Animals in India, Ceylon and Burma* (*Phil. Trans. Roy. Soc.*, 1901, series B, Vol. 194), pays particular attention to " the remarkable fact " that his Malabar Tract (in which the highlands of Ceylon are also included as an " outlier ") contains many Himalayan or Burmese vertebrates (or *both* Himalayan and Burmese) that are not found in other parts of the Indian peninsula. And, finally, in the *Catalogue of Indian Potamonidae*, published by the Trustees of the Indian Museum in 1910, this " remarkable fact " noticed by BLANFORD is corroborated in the distribution of the freshwater crabs. If one *has* to surmise how it is that so many animal forms represented in the highlands of Indo-China, Indo-Malaya, and Indo-Ceylon are absent from the greater part of the Indian peninsula, one might suggest a land-connection of the three regions in those Miocene times when South India and Ceylon appear to have been widely separated by sea from the Asian continent west of long. 90°E. ; and Carpenter's Ridge, standing up 6,000–7,000 feet from the greatest depths of the floor of the Bay of Bengal, between the Nicobars and Ceylon, might be supposed to represent one of the sunken finger-posts of that connection.]

A. A.

CHRISTOPHERS (S. R.). **Some Further Varieties of Indian Species of Anopheles, with Notes on the Species** *A. pallidus* **Theobald and** *A. philippinensis* **Ludlow.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 295–301. [5 refs.]

Here are described *Anopheles culicifacies* var. *adenensis*, from the Aden territory; *A. jeyporensis* var. *moghulensis*, from numerous localities in north-western and central India; and *A. maculatus* var. *dravidicus*, from numerous localities in north-eastern, central, and southern India—all three being " new " varieties. *A. varuna* of Iyengar is here placed as a variety of *A. minimus*. Differential diagnoses are given of *A. fuliginosus* Giles, *A. pallidus* (originally described as a variety of *fuliginosus*) and *A. philipp[in]ensis* Ludlow (formerly known as *A. fuliginosus* var. *nivipes*).

A. A.

STEKHOVEN (J. H. Schuurmans) & STEKHOVEN-MEIJER (A. W. Schuurmans). **Aanteekeningen omtrent anophelinenbroedplaatsen op de Bandoengsche Hoogvlakte.** [Notes on Anopheline Breeding Places on the Bandoeng Plateau.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 588-591.

This plateau has an altitude of 2,000–5,000 feet above sea level. The most common species was *A. barbirostris*, breeding in fish ponds, wet rice fields, puddles and pools on the sides of the roads. *A. vagus* and *rossi* breed in muddy pools, hoofprints of buffaloes, etc.; the larva of *A. fuliginosus* was common in rice fields up to an altitude of 5,000 feet, that of *A. kochi* in rice fields and fish ponds up to 3,000 feet. Other species were rather uncommon. In none of the breeding places were larvae found in great numbers as in the fish ponds near Batavia.

W. J. Bais.

LEON (N.). **Action des ectoparasites sur les culicides.**—*Ann. Parasit. Humaine et Comparée.* 1924. July. Vol. 2. No. 3. pp. 211–213. With 2 figs.

An Anopheles profusely infested with larval acarines is figured. A mycotic tumour of the abdomen of an Anopheles, consequent on a wound made by a Culicoides, is described, and a gastric hernia in an Anopheles, due to the same cause, is figured and described.

A. A.

CIUREA (T.) & DINULESCU (G.). **Ravages causés par la mouche de Goloubatz en Roumanie ; ses attaques contre les animaux et contre l'homme.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 323–342. With 1 fig., 1 map & 3 plates. [15 refs.]

The annual summer visitations of that peculiarly venomous Simulium midge (*S. columbaczense*) upon the farms and pastures of Transylvania and the Danube plains are well known. The peasants are prepared for them, and usually therefore the damage inflicted by these midges is limited to a few dozen cattle. In 1923, however, the invasion was particularly extensive and severe, and 16,474 animals—horses, asses, oxen, buffaloes, sheep, goats, pigs—were officially reported to have been killed in the course of a few days, with enormous suffering to the maddened creatures. It was noted that the mortality occurred in the first 4 or 5 days of the invasion—which points to the speedy acquisition of immunity by survivors.

The individual bite leaves a weal like a flea-bite, but confluent bites form haemorrhagic patches, swollen, hard, inflamed and extremely painful. Animals severely bitten become breathless and may die in a few hours; or they cease feeding and remain apathetic, their pulse and respiration become almost imperceptible and their temperature subnormal and they may die in 6 or 7 days, or they may gradually recover. At post mortem examination "nothing has been observed but congestions and degenerations of the chief viscera, especially the heart, liver, and kidneys," In man the bites cause a burning pain, and the petechiae may coalesce in erysipelas-like patches which may become oedematous and vesiculous or even pustulous, with concurrent inflammation of the lymph vessels and glands. In man also generalized symptoms occur--formication, cold extremities, algidity, feeble pulse, subnormal temperature, diarrhoea, transient retention of urine, but fatal results have not been recorded.

A. A.

TONNOIR (A. L.). **Australasian Simuliidae.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt. 3. pp. 213–255. With 13 figs.

This admirable monograph, which does not pretend to be final and exhaustive, contains, besides tables for the discrimination (so far as material is available) of the species of Australasian Simuliidae in their adult male and female, larval, and pupal stages, and besides significant descriptions of the several species, an excellent and interesting account of the bionomy of these flies and of their general structure as adults and as larvae and pupae. The species, 21 in number, are separated in two genera, namely *Simulium* (5 spp.) having antennae of eleven segments and *Austrosimulium* (16 spp.) with antennae of ten segments. Several of the species of the latter genus, however, cannot be discriminated in the adult stage, though their earlier stages—particularly the pupae—are easily distinguishable; 15 of the species are here recorded for the first time. The author disavows ENDERLEIN's classification of the Simuliidae, as unnatural.

A. A.

GLASER (R. W.). **A Bacterial Disease of Adult House Flies.**—*Amer. Jl. Hyg.* 1924. Sept. Vol. 4. No. 5. pp. 411–415. With 1 plate. [2 refs.]

Here is carefully described in itself and in its culture reactions, *Staphylococcus muscae*, an infection of houseflies which, under experimental observation, does not spread among these insects in epidemic fashion, but sporadically, and is very tardily fatal to 50 per cent., killing them in 7 to 29 days. The author states explicitly that the economic application of this staphylococcus is unpromising.

A. A.

GLASER (R. W.). **Rearing Flies for Experimental Purposes, with Biological Notes.**—*Jl. Econom. Entom.* 1924. Aug. Vol. 17. No. 4. pp. 486–496. With 5 figs. [5 refs.]

The flies here considered are *Musca domestica*, *Stomoxys calcitrans*, and *Lyperosia irritans*. The author describes his methods of breeding and handling them for experimental purposes in detail that cannot be summarized. Principles and practices emphasized are that the insects should never be treated roughly, *e.g.*, that in starting breeding operations flies should be caught singly in a tube; that longevity and reproduction are greatly influenced by the nature of the food and by conditions of temperature and moisture ; and that scrupulous cleanliness must be observed.

Certain observations of general biological interest are appended. The author has reared *Musca domestica* from mid-April to mid-December, after which the progeny died in the larva or pupa stage. For a long life and healthy reproduction this species must have sugar (or assimilable starch) and some form of soluble proteid ; milk is thus very suitable. On this diet it might live up to 57 days. Favourable temperatures for the larva are 30°–35°C. The developmental cycle from egg to adult at 20°–35°C. was 13–19 days. The sex ratios of all broods were generally equal. Fresh horse-dung was the best pabulum for the larvae.

Stomoxys calcitrans was reared from April 22nd to December 7th, after which the progeny died out. This species will live and will breed on a diet of defibrinated blood administered in the usual way on the covers of breeding-jars. The developmental cycle from egg to adult ranged from 14 days in a hot July to 43 or more days in spring and autumn. The sex ratios of broods showed a slight preponderance of males.

Lyperosia irritans sticks always to cattle, except that now and then females temporarily drop from a beast to deposit their eggs in the fresh dung. Wild gravid females placed in breeding-jars containing fresh cow-dung will drop eggs for 3 to 5 days and may be kept alive for as many as 25 days on defibrinated blood, but they do not exercise their reproductive function on that diet. The developmental cycle from egg to adult in this species was 11 days in a hot July and 20–22 days in May-October. The sex ratios observed were equal.

A. A.

LLOYD (Llewellyn), JOHNSON (W. B.), YOUNG (W. A.) & MORRISON (H.). **Second Report of the Tsetse-Fly Investigation in the Northern Provinces of Nigeria.**—*Bull. Entom. Res.* 1924. Aug. Vol. 15. Pt. 1. pp. 1–27. With 1 coloured map, 5 charts & 2 figs. [8 refs.]

The second instalment of this valuable report (for first instalment see this *Bulletin*, Vol. 20, p. 794) records the details and results of a systematic investigation of the breeding-seasons, food, and trypanosome infections of *Glossina morsitans* and *tachinoides* carried on during 14 months in a set area of the Sherifuri district of N. Nigeria.

Additional evidence of a breeding episode was supplied (1) by an obvious prevalence of flies having a pliant ptilinum, and (2) by an equally plain preponderance of unhatched pupae over empty pupa-cases. Thus, in the case of *G. tachinoides*, sudden and striking increase, at the *beginning of the dry season*, in the proportion of comparatively soft flies with a ptilinum easily forced out by pressure, concurrent with evidence of a very high percentage of living pupae, was taken to indicate that as the onset of the breeding season. By similar reasoning the onset of breeding of *G. morsitans* was settled to be about six weeks later.

The nature of the food-host during the critical wet season was determined not by the exact blood precipitin test employed by BULL and KING in their Anopheles experiments (see this *Bulletin*, Vol. 21, p. 143), but by microscopic examination of red blood corpuscles. This method is good enough for separating mammalian blood and for discriminating between avian and reptilian corpuscles; but for mammalian blood it has merely permitted the authors to distinguish between some miscellaneous collections individually, inclusive of species of such distant affinity as dog and man, water-buck and fruit-bat, bush-buck and squirrel, wart-hog and donkey. Two significant and valuable facts, however, have been elicited from all this hard labour on mammalian bloods, namely, that during the critical wet months immediately preceding the breeding-season consummatory for the perpetuation of the species *G. tachinoides* is sustained very largely by the blood of reptiles (probably crocodile and Varanus), and *G. morsitans* to some extent by that of birds. Evidence is also accumulated that *tachinoides* is a much more miscellaneous blood-sucker than *morsitans.*

The nature of the trypanosome infections was determined by systematic examination of the proboscis, anterior part of salivary glands and gut of a large number of flies, and the results are thus summarized by the authors: —

"The infection of the flies with *T. vivax* and *T. congolense* bears a close relation to the amount of blood obtained from antelope, and consequently *morsitans* is in general nearly four times as heavily infected as *tachinoides.* Infections with *T. brucei* and *T. gambiense* are scarce in this locality. Trypanosome infection rises just before the main breeding season in *morsitans* in all localities and in *tachinoides* in places where the fly is largely a mammal feeder. The proportional infection in general falls in the season of most rapid breeding, owing to masking of the actual rise by the number of young flies examined" [flies with pliant ptilinum, etc.]. "It rises rapidly when breeding ceases. The total infection is reduced, when fly food is hard to obtain, in the time of long grass and flood, owing to *T. vivax* infections dying out when the flies are starved. In some cases *T. grayi* may be obtained by *tachinoides* when it feeds on Varanus, and a somewhat similar infection in the laboratory may be obtained by feeding the flies on toads."

The authors have a little evidence, which they intend to follow up, that burning of the grass shortly before the rains begin may hamper the free breeding of *morsitans* and in some circumstances that of *tachinoides.* They also mean to observe the effects of excluding game and pig from a fly focus in the dry season.

A. A.

LAMBORN (W. A.). **An Attempt to Control** *Glossina morsitans* **by Means of** *Syntomosphyrum glossinae,* **Waterston.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt. 3. pp. 303–309. With 1 map in text.

In 1914 AUSTEN suggested the introduction of the Chalcidid Spalangia (known to be a destructive parasite of Muscid flies) into tracts where *Glossina morsitans* is a pest; the author, however, discovered Spalangia to be of common occurrence in E. Africa, where, though it is destructive to small Muscids, it does not, so far as can be ascertained, touch Glossina.

Since then a good deal of work has been done on this subject in various parts of tropical Africa, as a result of which several species of Mutillid and Chalcidid Hymenoptera as well as of Bombyliid flies have been discovered as natural native parasites of Glossina, and particularly of *G. morsitans.*

The author explains that not all these natural parasites give promise of effective exploitation against tsetse-flies generally. For general application such a parasite should be one that can be easily bred in the local laboratory (*i.e.*, must be patient in captivity and capable of adapting its life-cycle to some convenient laboratory host), and that can be so bred quickly in large numbers (*i.e.*, must be prolific and have a short life-cycle). The author decided upon the Chalcidiid *Syntomosphyrum glossinae* as a parasite that could thus easily be bred in the laboratory in numbers large enough to be launched against *G. morsitans*, in a given area, with prospect of success.

Syntomosphyrum was bred in the puparia of various Muscid flies, particularly Sarcophaga. In one instance a parasitized puparium of Sarcophaga gave issue to 40 males and 94 females of Syntomosphyrum. The males were eager to pair, and the females were ready to attack fresh puparia within a few hours of emergence.

A sufficient number of laboratory-parasitized Sarcophaga puparia being in process of accumulation, they were gradually distributed along paths and game-runs in a peninsula of Lake Nyasa having an area of about 42 square miles. (For protection against other insects the parasitized puparia were placed each in a tube of bamboo having the open end plugged and a hole in one side for the escape of the parasites as they hatched, the tubes being stuck in the ground upright). In the course of five months (June–October) a number of parasitized puparia had been distributed sufficient to give issue by approximate estimate to 277,179 individuals of Syntomosphyrum.

It must be explained that for some months immediately before this distribution of laboratory-parasitized Sarcophaga-puparia the naturally existing incidence of Syntomosphyrum in the selected area of experiment had been as carefully as possible determined. During the five immediately preceding months 1,083, and during a term immediately before that 935, puparia of Glossina had been collected in the area, and 0·6 per cent. of the first lot and 0·4 of the second lot had been found naturally parasitized by Syntomosphyrum.

Two months after the distribution of the laboratory-parasitized Sarcophaga-puparia had been completed an investigation of the selected area was commenced to ascertain whether the incidence of Syntomosphyrum upon Glossina had been affected as a result of the experiment. In the course of 3 months (January-March) 516 puparia of Glossina were collected in the area, and 8·7 per cent. were found to be parasitized by Syntomosphyrum.

" It is true that a rise in the parasitism rate to the degree indicated is a far step from having effected a degree of control of the fly of real practical value. It should, however, be pointed out that the parasites were liberated during the dry hotter months of the year, when insect life generally is at a minimum . . . Experimental work with an even greater output of Syntomosphyrum maintained during the round of seasons might possibly be worth while. With efficient assistance, if only that of intelligent and reliable natives, there appears to be practically no limit to the numbers of the parasites that could be bred in the laboratory, at all events during the middle months of the year."

A. A.

CURSON (H. H.). **Outline of the Floral Regions of Zululand.**—Reprinted from the *S. African Jl. Sci.* 1923. Dec. Vol. 20. pp. 323–346. With 6 figs. & 1 map. [8 refs.]

The point of interest for us in this botanical paper is to be found in the statements that " in Zululand . . . Glossina occur only in those areas where bushveld is the chief type of vegetation," and that in "valley bushveld"—*i.e.*, in the valleys of bushveld tracts that lie between the coastal plains and the highlands—" it is the bush of the stream banks that Glossinae prefer, and unfortunately it is these very situations that the European farmer neglects" to clear and cultivate. Bushveld, as pictured in the plate, looks like a blend of moorland and scrub; it appears from the text to have been described by different authors as park-like landscape, tree steppe, bush savannah, and deciduous savannah forest.

A. A.

VAN SACEGHEM (René). **Note sur la dispersion des Glossines au Kivu.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. p. 177. [1 ref.]

Glossina palpalis (var. *fuscipes*) has been said to exist at an altitude of 1,500 to 3,000 metres (about 5,000 to 10,000 feet) among the volcanoes of Kivu, although the observation has been doubted. The author has searched this region and states that Glossina does *not* exist along the shores of the lake of Kivu.

A. A.

TROLLI (G.). **Contributions à l'étude de la distribution géographique des Glossines.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 181–190. With 1 map.

The author gives numerous particularities of distribution of *Glossina palpalis, morsitans, pallicera, tabaniformis,* and *fuscipleuris* in the Belgian Congo, along with a map indicating the spots where he has observed the first two species.

A. A.

POTTS (W. H.). **A New Variety of** *Glossina schwetzi,* **Newstead & Evans, from the Belgian Congo.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 205–206. With 1 text fig.

Independent taxonomic recognition is proposed for a single specimen differing from type in some small details of the male genitalia.

A. A.

DIXON (O. Jason). **An Unusual Case of Rhinal Myiasis, with Recovery.**—*Jl. Amer. Med. Assoc.* 1924. Oct. 25. Vol. 83. No. 17. pp. 1332–1333. With 3 text figs.

One interesting feature here is that the victim was a clean, sober, industrious man. He had a nose-bleed; and the day afterwards, as he was using a scythe, he thought a bug had got into his nose. He felt certain that he had got it out, and dismissed the matter. Some days after this he felt something wrong with his nose—pain there, and headache; and when, seven days later, he was brought for treatment, he was delirious, had a temperature of 101·6°, and "presented the exact picture of facial erysipelas"; a nauseating smell and some occasional drops of foul sanguineous fluid came from his nose, and both nostrils were full of maggots and slough. 221 live maggots were removed on the spot and then both nostrils were plugged with cotton-wool soaked in chloroform. After 5 minutes the plugs were removed; 14 dead maggots were picked away, and soon the patient's condition was much improved, though he subsequently discharged some dead maggots. Three days after the first treatment the patient expectorated a few more living maggots; so the treatment was repeated, and 10 days afterwards the last dead maggot was got rid of. The patient recovered in due time, but his middle turbinate bones and a considerable part of the cartilaginous septum were destroyed. The maggots, which are well figured, are screw-worms.

A. A.

KEILIN (D.). **On a Case of Intestinal Myiasis in Man produced by the Larvae of a Sarcophagine Fly.**—*Parasitology.* 1924. July. Vol. 16. No. 3. pp. 318–320. With 2 text figs. [3 refs.]

The author identifies as first-stage larvae of a Sarcophagine fly some small maggots of a lot of 40 to 50 passed at Nairobi by an anaemic sepoy after treatment for supposed hookworm. The patient subsequently made a rapid recovery. Incidentally the author mentions other cases proving that larvae of Sarcophagids—he mentions specifically *S. haemorrhoidalis*—can live in the human intestine.

A. A.

DESOIL (P.). **Valeur de l'hypothèse de l'infestation par oeufs de mouches myasiques dans le cas de myase intestinale chez l'homme.**—*C.R. Soc. Biol.* 1924. Nov. 21. Vol. 91. No. 32. pp. 1079–1081.

The observations here recorded confirm those of other authors. They show that the eggs of Muscidea, though capable of withstanding a certain amount of chemical injury in vitro, are quite unsuited for the rough treatment of the alimentary canal, where they are soon killed or whence they are soon ejected. Intestinal myiasis therefore can hardly be due to ingestion of fly eggs.

A. A.

PUMPELLY (William C.). **Case of Human Infestation by Larvae of the Fly** *Eristalis Tenex* [*sic*].—*Jl. Amer. Med. Assoc.* 1925. Jan. 3. Vol. 84. No. 1. p. 37.

Case of a man who had long suffered from constipation and in whom "nothing unusual was found except tenderness . . . along the course of the descending colon." In his faeces "worms" of two kinds were observed, one kind being rat-tail larvae of the "drone-fly" *Eristalis tenax.*

A. A.

CHOWN (Gordon). **Report of a Case of Cutaneous Myiasis in an Infant.** *Wohlfahrtia vigil* **(Walker) Infection.**—*Canadian Med. Assoc. Jl.* 1924. Oct. Vol. 14. No. 10. pp. 967–968. [3 refs.]

In this case the infestation first showed as small boils scattered about the neck and one on the pinna and one in a popliteal space—in all 12; 14 very active maggots about 4 mm. in length were ultimately removed from them (3 coming from one spot).

A. A.

BACOT (A. W.) & MARTIN (C. J.). **The Respective Influences of Temperature and Moisture upon the Survival of the Rat Flea** (*Xenopsylla cheopis*) **away from its Host.**—*Jl. of Hyg.* 1924. Sept. Vol. 23. No. 1. pp. 98–105. With 3 text figs. [10 refs.]

The rapid fall of cases with the onset of hot weather is a characteristic feature of plague epidemics in Northern India, but it is impossible to say how far this may be due to the high temperature and how far to concurrent drying power of the atmosphere. Epidemiological observations made in Mauritius, Southern India, and Java suggest that a rise of temperature without increased drying power restrains plague epidemics. Drying power, of coure, depends on saturation deficiency, and is not indicated by the meteorological term "relative humidity." Previous investigations both in India and in England have shown that saturation deficiency is inimical to the flea at almost every stage of its life-history. The object of the experiments described in this paper was to ascertain the separate influences of temperature and drying upon the longevity of fleas (dissociated from their host where, of course, they enjoy a nearly constant climate). The ingenious methods employed for arranging atmospheres having the same temperature but different saturation deficiencies, and *vice versa*, and of exposing batches of laboratory-bred fleas (*X. cheopis*) of various age and condition to the varying atmospheric environment cannot be abridged.

The conclusions from the experiments are as follows :—

"1. The survival of fleas (*X. cheopis*) apart from their host is approximately in inverse proportion to the saturation deficiency of the air, provided the temperature and air movement are constant. In other words, it is proportional to the rate at which they lose water.

"2. Under similar conditions but with constant saturation deficiency, their length of life is reduced to between one-half and two-thirds by 10° C. rise in temperature. Compared with the effect of saturation deficiency, that of temperature upon the longevity of fleas is, within the range of climatic conditions over the greater part of India, a smaller one.

"3. A variation in saturation deficiency from 5 mm. to 35 mm. such as occurs in the plains of Northern India at different seasons would, accordingly, shorten the average duration of life of wandering rat fleas in the proportion of 15 to 1. As a rise in mean temperature occurs simultaneously with the increase in saturation deficiency and may amount to a difference of 20° C. between January and June this would reduce the length of life of wandering fleas to about one-third. The effect of saturation deficiency and increased temperature will be additive and would go a long way to explain some of the climatological features of the epidemics."

A. A.

BUCHANAN (George). **La faune des rongeurs et de leurs parasites cutanés qui interviennent dans la propagation de la peste.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. Nov. Vol. 16. No. 11. pp. 1392–1406.

Most of the contents of this paper are familiar. They include a list of Muridae known to inhabit Great Britain, a list of fleas of more or less common occurrence on British rats, and a list of the fleas of known possibility of occurrence on rats in different countries ; also a statement of fleas found on rats in particular places in Great Britain. For instance, in the area of a small epidemic of plague in East Suffolk in 1909–10, 584 fleas were obtained from 568 rats examined; of these fleas one was *Ctenophthalmus bisoctodentatus*, 259 were *Ct. agyrtes*, and 324 *Ceratophyllus fasciatus*; the number of fleas found on the individual rats ranged from 0 to 10, except in one case where 30 were discovered; among fleas found in 6 rat-nests were 2 *Hystrichopsylla talpae*. The published opinions of WILKINSON and of LATHAM on the possible intervention of *Pulex irritans* as a plague carrier are quoted also.

A. A.

BLAZY (M. C.). **Considérations sur les rapports de la faune des rongeurs avec les manifestations pesteuses à Dakar.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 834–845. With 1 text fig. [35 refs.]

There is not much substance in this paper, nor any novelty in the conclusion, which is that "the relation between the rodent fauna and the manifestations of plague is one of cause and effect." As regards facts, it is stated that 278,755 rats were destroyed at Dakar in 1922 23, and that none of the very few examined showed any evidence of plague infection; that the predominant flea infesting the rats examined was *Xenopsylla cheopis*, and that none of the few fleas examined gave any such evidence; and that among the human population there has not been any case of plague since the 17th July, 1923.

The local rodents, identified by ROUBAUD, are *Mus rattus*, *M. alexandrinus*, *M. decumanus*, *M. concha*, *M. golunda campanae*, and hybrids between some of these. The number of fleas obtained from 185 rats examined was 462.

A. A.

LASNET. **Note contenant, en ce qui concerne l'Indochine, des renseignements sur la faune des rongeurs et de leurs parasites cutanés, sa répartition topographique et ses rapports avec les manifestations pesteuses.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. Nov. Vol. 16. No. 11. pp. 1407–1414. [1 ref.]

Epidemic foci of plague are known to exist in South Annam, Cochinchina, Saigon-Cholon, Cambodia, and Phnom-Penh. At the last-named place a musk-rat (*Crocidura murina*) was discovered to be heavily infected and also to be infested with *Xenopsylla cheopis*. *Mus decumanus* and *rattus* are here mentioned, along with other species designated only by their vernacular names, as the common rodents, and *Xenopsylla cheopis* as the greatly predominant rat-flea, though *X. astia* and *Pulex irritans* have also been observed.

A. A

PAWLOWSKY (E.) & STEIN (A. K.). **Experimentelle Untersuchungen über die Wirkung der Flöhe auf den Menschen.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 131–136. [3 refs.] German summary p. 216.

From the summary this appears to be a paper of the "precious" sort. The gist of it is that "purpura pulicosa"—or small blood-stain that persists for 2 or 3 days after a flea-bite—can be produced by injection of saline emulsion of flea salivary glands into the skin; and that the saliva of the dog-flea and man-flea is weaker than that of Pediculus.

A. A.

BLACKLOCK (B.) & THOMPSON (M. G.). **Rat-Fleas in Freetown, Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 135–137. [5 refs.]

From 62 black rats and 38 brown rats collected from various parts of Freetown (Sierra Leone) in January and February, 657 fleas were removed, namely, 419 *Xenopsylla brasiliensis,* 235 *X. cheopis,* and 3 *Ctenocephalus canis.*

A. A.

JOBLING (B.). **A Contribution to the Biology of *Ornithodorus moubata,* Murray.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt 3, pp. 271–279. With 1 plate & 3 figs. [11 refs.]

As the biology of *Ornithodorus moubata* has already been investigated by CUNLIFFE (see this *Bulletin,* Vol. 19, p. 492) the present author confines himself to certain novel or particularly significant points in this well-illustrated paper

In most cases the larva is ready to leave the egg on the 8th day and remains motionless until the first moult, which occurs after an interval averaging 4 (3–5) days. The majority of adult males appear after the 4th moult ; of females after the 5th. The coxal fluid (which seems to be remarkably copious) is secreted a few minutes after repletion, and in all the nymph stages as well as by the adult. A female may be fertilized several times in succession, and by several males—the author having observed females with 3 and 4 spermatophores attached—and may be fertilized after laying several batches of eggs. The term between successive meals and the succeeding parturitions averaged 8 (6–13) days. The female occupies on an average 7 (2–12) days in laying a batch of eggs. She does not leave the eggs after parturition until a good many have hatched, and thus larvae and even nymphs may be widely dispersed by her when she moves off.

Throughout these interesting experiments the ticks in all stages were lodged in open unplugged tubes containing a little sand, the tubes being kept in large jars having a little slightly moist cotton-wool in the bottom, and the jars stored in an incubator at 29·5°–30° C. When feeding the ticks (on the ear of a rabbit) exposure to light makes them slow to bite.

A. A.

BEQUAERT (J.). **Un Hyménoptère Béthylide qui pique l'homme dans les habitations au Congo.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 163 165. [2 refs.]

Records the observation that little wasplets of the genus Scleroderma frequently sting man in Leopoldville. The same observation has been made of other species of the cosmopolitan genus Scleroderma in other parts of the world. [Scleroderma is placed in the Proctotrypid family of the Hymenoptera Parasitica ; the female, which possesses the sting, is wingless.]

A. A.

GOODWIN (E. St. G. S.). **The Cockroach. I. Considered as a Possible Disseminator of Disease. II. Methods of Eradication.**—*Jl. Roy. Nav. Med. Serv.* 1925. Jan. Vol. 11. No. 1. pp. 23–30. [15 refs.]

It is proverbial that a sailor can do anything, and Commander Goodwin in transforming an object of aversion into an object of graceful literary art has well upheld the invincible traditions of the Navy. He does not tell us anything new about the cockroach and its insanitary ways or about methods devised for its destruction, but he gives us the old story very fully and in a new and rare investment of erudition and humour. His own experience relates to the ship cockroach, against which, he says, sodium fluoride is useless in the moist sea atmosphere. The primitive method of burning brimstone in open pans is also useless in a ship ; but sulphur fumigation with the Clayton apparatus if twice repeated, at intervals of 14 and 28 days respectively, so as to smite any young insects hatching from the very resistant egg-capsules, he is quite satisfied with, at any rate for ships-of-war. The author happily reminds us that Ulysses [Odyssey, Book 22, lines 92–94] used fire and brimstone for cleansing his ancestral halls after the slaughter of the suitors.

A. A.

TAKAHASHI (R.). **Life-History of Blattidae.**—*Dobutsugaku Zasshi* [*Zool. Mag.*]. 1924. May. Vol. 36. No. 427. pp. 215–230.

The following observations of the life-history of the large red cockroach (*Periplaneta americana*), made in the tropical climate of Formosa, may be extracted.

The adult female may live 13 to 25 months, and may produce 25 to 71 egg-capsules, each containing 16 eggs. The egg may hatch in 19 to 70 days. The period of growth from new-hatched larva to adult may take 8 to 19 months.

A. A.

LARROUSSE (F.). **Deux nouveaux cas de larves de névroptères éventuellement hématophages.**—*Ann. Parasit. Humaine et Comparée.* 1924. Oct. Vol. 2. No. 4. p. 354. [2 refs.]

After noticing that BLANCHARD and also KROHN have recorded of larvae of the Neuropterous family Hemerobiidae that they may attack man and suck blood, the author gives his own observations corroborative of the fact. At Arradon, Morbihan (Brittany) he caught several Hemerobiid larvae *flagrante delicto.* The bite is painful and itches for several hours. The author also reports another ample confirmation from a correspondent elsewhere.

A. A.

STRICKLAND (C.). **On Spider-Lick, a Dermatozoosis.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 385–387. With 5 figs. [2 refs.]

" Spider lick " is the name popularly bestowed on a sudden and painful dermatitis of common occurrence in India and vaguely and mysteriously attributed to spiders. From observations of intelligent correspondents and from his own experiments Strickland is able to explain that it is caused by the blistering secretion of a Staphylinid beetle, *Paederus fuscipes.* [The genus *Paederus* is widely distributed, and others of its species are notoriously troublesome in the same way in certain parts of South America and of the Malay Archipelago.]

A. A.

CULPEPPER (M. B.). **My Experience with Tarantula Bites.**—*Southwestern Med.* 1924. Oct. Vol. 8. No. 10. pp. 499–500.

Four cases of "tarantula" bite at Carlsbad, in New Mexico. Their common phenomena were (1) insignificant local reaction; (2) pain, ensuing after some hours delay, but then gradually spreading all over the body, smiting particularly the bones, cramping the heart, obstructing the breathing, and culminating in agony; (3) slow abatement of symptoms, despite anodyne treatment; (4) prolonged incapacity—in one case extending to the 30th day. In one case, where the patient came for treatment within two hours and received local subcutaneous injections of a half-per cent. solution of permanganate of potash, the symptoms were very slight and recovery was complete in two or three days.

A. A.

ROSS (I. Clunies). **The Bionomics of *Ixodes holocyclus* Neumann, with a Redescription of the Adult and Nymphal Stages and a Description of the Larvae.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 365–381. With 1 plate & 2 text-figs. [7 refs.]

A careful description of *Ixodes holocyclus*—a three-host tick—in all its stages, and of its life-cycle as observed in the laboratory. This tick, which occurs along almost the whole coastal region of E. Australia, is the cause of a paralysis extremely common and fatal to dogs and cats and also of occasional occurrence in children and young stock; a common host, in Nature, is the bandicoot (Perameles). The eggs of this tick hatch in 49–61 days in warm weather. The larvae remain attached to their host for 4–6 days, and (in warm weather) complete their development into nymphs in 19–41 days. The nymphs remain attached to their host for 4–7 days, and (in warm weather) complete their development into the adult stage in 21–71 days. The adult females remain attached to their host for 6–21 days. Males are rarely seen on a host, and have never been found attached or showing signs of engorgement. All stages of the tick soon succumb to desiccation. Under the most favourable conditions of climate and facilities of attachment to suitable hosts, two complete generations might be fulfilled in a year; but with such conditions unfavourable more than a year might be required for the maturation of a single generation.

A. A.

FERGUSON (E. W.). **Deaths from Tick Paralysis in Human Beings.**—*Med. Jl. Australia.* 1924. Oct. 4. 11th Year. Vol. 2. No. 14. pp. 346–348. [10 refs.]

The author gives a full account of one recent case and short abstracts of seven other previously observed cases of death from tick-bite paralysis in Australia. The recent case now recorded was a boy of 16 months who died 2 days after admission to hospital. He had not been well for a month, and 3 days before admission suddenly became unable to stand; after admission he lapsed into a state of coma and generalized paralysis. A tick (*Ixodes holocyclus*) not quite half replete was discovered in his scalp just before death. At autopsy nothing was obvious to the naked eye, but some inflammation at site of bite. Microscopic sections of cord and various parts of brain showed intense congestion. Two rabbits inoculated intracranially with emulsion of brain or cord were unaffected. Two of six mice inoculated subcutaneously or intraperitoneally died, but their death might have been attributable to the intervention of staphylococcus.

Of the seven cases collected from the records one was a girl of about 13 or 14 years and all the others were young children. In every case only one tick was found attached, the site of attachment usually being on the head or neck (twice inside the auditory meatus), in one case on the chest. In one case there was no paralysis and death was attributed to toxaemia.

The author thinks it pretty certain that the common scrub tick, *Ixodes holocyclus*, is responsible in all fatal cases of tick-bite paralysis in human beings in Australia.

A. A.

i. MOSS (H. St. Leger). **A Case of Tick Paralysis.**—*Med. Jl. Australia*, 1924. Nov. 22. 11th Year. Vol. 2. No. 21. p. 556.

ii. FERGUSON (Eustace W.). **A Case of Tick Paralysis.** [Correspondence.]—*Ibid.* Dec. 20. No. 25. p. 672.

i. The patient, a lady, complained of sharp pain in the legs of ten days' and blurred vision of two days' duration. A small abscess on the labium—not supposed by her to be connected with the main complaint—was found to be due to the attachment of a bloated tick; complete recovery soon followed its removal.

ii. The tick concerned in the above case has been identified by this writer as *Ixodes holocyclus*, a species locally responsible for paralysis in dogs.

A. A.

WALCH (E. W.). **On Pseudo-Typhus of Sumatra. Part I. On Larvae and Nymphae of Sumatra Trombiculae, including two Carriers of the Disease. Part II. Some Notes on Epidemiology.** [WALCH (E. W.) & KEUKENSCHRIJVER (N. C.).]—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 583–626. With 37 text figs. [15 refs.] pp. 627–643. With 1 plate. [11 refs.]

Walch's work on the Trombicula mites of Sumatra has been noticed in the *Bulletin* (Vol. 20, p. 473 & p. 800; Vol. 21, p. 790); he and his colleague now develop the argument that *Trombicula deliensis*, as the only mite addicted equally to rat and man in tracts where Sumatran pseudotyphus is truly endemic, must be the responsible carrier of the virus—the rat being, as they suppose, a natural reserve of the disease. (In an established epidemic other species, particularly *T. schuffneri*, may be carriers of infection between human beings). In a recent epidemic in some young rubber estates, much overgrown with weeds, and sheltering rats infested with *T. deliensis*, the climax of the epidemic synchronized with the months (May-June) when the largest numbers of this species of mites were to be found on the individual coolies weeding the estates. From the fact that a coolie, upon whom a mite had been taken *flagrante delicto*, exhibited an ulcer and the symptoms of pseudotyphus three weeks afterwards, the incubation period is concluded to be "somewhat long." Rats experimentally infected showed no reactions except enlargement of spleen; and an abnormally large number of rats with enlarged spleen having been captured in the area of the epidemic is therefore held to justify the conclusion that the epidemic originated in naturally infected rats. Experimentally, the infection could be transmitted, but not with certainty, by inoculation from man to gibbon, and directly to gibbon by injection of infected mite-squash. During the epidemic the mite (*T. deliensis*) was found on certain wild birds, and this may explain how the infection may be spread naturally from island to island.

A. A.

i. Lynch (Kenneth M.). **Notes on the Natural and Cultural Growth of Certain Intestinal Flagellates.**—*Amer. Jl. Trop. Med.* 1924. Nov. Vol. 4. No. 6. pp. 537–545. [16 refs.]

ii. de Mello (Froilano) **Note sur les formes actives d'une thécamèbe, parasite fréquent de l'intestin des indigènes d'Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 397–400. With 1 plate.

iii. Jacob (Erich) **Die Verwandtschaftsbeziehungen der Zeckengattungen. Versuch eines natürlichen Systems auf vergleichend-morphologischer Grundlage.**—*Parasitology.* 1924. July. Vol. 16. No. 3. pp. 313–316.

iv. Florence (Laura). **An Intracellular Symbiont of the Hog Louse.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp. 397–409. With 2 plates. [16 refs.]

v. Wing (H. E.). **Sucking Lice of Jack Rabbits.**—*Ibid.* Nov. Vol. 4. No. 6. pp. 547–551. [1 ref.]

vi. Southwell (T.). **On a Collection of Linguatulids in the Liverpool School of Tropical Medicine.**—*Ann. Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 515–531. [5 refs.]

vii. Korobkowa (E.) & Sherishorina (S.). **Bacteriological Means of Fighting Rodents. Increase in the Virulence of Bact. Danysz.**—*Rev. Microbiol. et Épidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 143–146. [6 refs.] English summary pp. 218–219.

viii. Delanoë (P.). **Du nombre des mamelles chez le Rat d'Alexandrie, *E. rattus* var. *alexandrinus* G.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 589–590.

i. These notes, if discursive, are interesting. They do not contain any new formulae or describe any novel methods.

ii. Describes and figures *Chlamydophrys stercorea* as observed in 4 of 39 enteritis cases in Angola.

iii. Prospectus of an essay on the inter-affinities of the genera of ticks.

iv. Contains, besides descriptive matter, a useful review of the general subject, with references to original papers.

v. The sucking lice of jack rabbits are of interest in connexion with the transmission of tularaemia between these animals. The species observed by the author are *Haemodipsus ventricosus* and *H. piliferus*—the latter a new species here described—and *Linognathus piliferus*, the common dog-louse.

vi. A useful taxonomic paper.

vii. The virulence of Danycz rat-virus soon decreases, even when passed through rats; but the author finds that it is increased by admixture of *Bacillus proteus vulgaris*—1 part of the latter to 2 of the former.

viii. *Mus rattus* var. *alexandrinus* as observed at Mazagan may possess 4, or 6, or more frequently 5 mammae.

A. A.

i. Anderson (T. J.). **Ectoparasites recorded from Kenya Colony an Protectorate, with their Hosts.**—*Kenya Med. Jl.* (Supplemen No. 2). 1924. Sept. 8 pp.

ii. Williams (C. B.). **An Improved Light Trap for Insects.**—*Bull Entom. Res.* 1924. Aug. Vol. 15. Pt. 1. pp. 57–60. With 2 figs.

iii. Cooling (L. E.). **A Synonymic List of the More Important Species of Culicidae of the Australian Region.**—*Commonwealth of Australia Dept. of Health. Service Publication (Tropical Division) No. 2* 1924. 61 pp.

iv. Ingram (A.) & Macfie (J. W. S.). **The Mosquitos of Accra.**—*Ann Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 263-264.

v. Hatori (Jyuro). [**Supplement to Anopheles Distribution in Formosa** *Anopheles naniwa*, **n.sp.**]—*Taiwan Igakkwai Zasshi* (*Jl. Formosan Med. Soc.* 1923. Nov. No. 231. [Summarized in *Japan Med World.* 1924. Mar. 15. Vol. 4. No. 3. pp. 74–75.]

vi. Wright (W. Rees). **On the Hibernation of Adult Mosquitos.**—*Ann Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 619-627. [16 refs.]

vii. Kudo (R.). **Studies on Microsporidia parasitic in Mosquitoes. VI On the Development of** *Thelohania opacita*, **a Culicine Parasite.**—*Jl Parasit.* 1924. Dec. Vol. 11. No. 2. pp. 84 89. With 1 plate & 1 fig. [7 refs.]

viii. Sinton (J. A.). **Notes on Some Indian Species of the Genus Phlebotomus. Part IX.** *Phlebotomus simillimus* **var.** *hospitii* **nov var.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp 261-271. With 1 plate. [3 refs.]

ix. Legendre (J.). **Sur l'existence de** *Phlebotomus perniciosus* **en Saintonge.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17 No. 10. pp. 894-896. [1 ref.]

i. A very useful record.

ii. "It must be emphasized" that this trap is meant for obtaining insects in good condition for study; not for the wholesale destruction of troublesome insects.

▶ iii. The author is to be congratulated upon the accomplishment of this most useful piece of work; though only a zoologist can realize the amount of distasteful and intractable labour involved in its fulfilment.

▶ iv. A list of 68 species found within the municipal limits of Accra (Gold Coast).

v. The "n.sp." of the title is stated in the text to be identical with *A. aitkeni.*

vi. Some observations on the hibernation of *Anopheles maculipennis*, *Culex fatigans*, and *Theobaldia annulata.*

▶ vii. The microsporidian here described and figured in all stages of schizogony and sporogomy is observed to be a mortal infection in certain species of Culex.

viii. *P. simillimus* is a West African species described by Newstead; the new variety here described was found by the author in Kashmir at an altitude of 2,023 feet.

ix. Observation of *Phlebotomus perniciosus* in the Department of Charente-Inférieure.

A. A.

LABORATORY METHODS.

GORDON (A. Knyvett). **A Useful Stain for Blood Films.**—*Lancet.* 1925. Jan. 17. p. 127.

The following stain is recommended for the staining of blood films, in which it is necessary to bring out the granules characteristic of different types of calls.

The composition of the stain is: Eosin-methylene blue, 0·02 gm.; eosin-methylene-violet, 0·02 gm.; methyl alcohol (pure), 25 cc. The film is flooded with undiluted stain for one minute, then an equal part of distilled water is added, and the diluted stain allowed to act for three minutes, followed bv distilled water for about two minutes. The film is then dried and mounted either in neutral Canada balsam, or, preferably, in green Euparal, which improves the definition of the granules, and is also not so liable to cause fading of the specimens.

This single process stain is said to give results indistinguishable from those obtained with the panoptic method.

E. Hindle.

EPSTEIN (H.). **Weiterer Beitrag zur Blut- und Blutprotozoenfärbung (Toluidinblau-Eosin).** [Additional Observations on the Staining of Blood and Blood-Protozoa.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. June 16. Vol. 92. No. 1–2. pp. 148–150. [3 refs.]

The following method is recommended:—

Films are fixed in the ordinary way and then stained with the film side downwards, for 15 to 60 minutes, in a Petri dish, with a mixture of equal parts of two solutions. The first solution is made by dissolving 1 gm. of Toluidin Blue (Hoyer) and 1 gm. of lithium citrate in 100 cc. distilled water and filtering. The second is a 0·016 per cent. aqueous solution of Eosin B.A. The strength of the latter may be varied between 0·01 and 0·03 per cent. according to the requirements. After staining the films are washed under the tap and dried with filter paper.

E. H.

WILLIAMS (B. G. R.), assisted by WILLIAMS (E. M.), TIBURTIA (Sr. M.) & DRUMMY (Margaret). **Further Studies with Cresylecht Violet, including a Report of my Six-Second Method for Staining Tissues.**—*Jl. Lab. & Clin. Med.* 1925. Jan. Vol. 10. No. 4. pp. 312–315. [1 ref.]

The only Cresylecht Violet found to be any use was one supplied by the National Aniline and Chemical Co., Inc., U.S.A. A concentrated solution of the stain in strong formalin is employed and it is essential to use a formalin that does not contain methyl alcohol.

The stain can only be used for frozen sections of unfixed material, or tissues in 10 per cent. formalin. The sections are covered with the undiluted solution of the stain for about six seconds and then washed in a dish of water and at once examined under the microscope. The author claims that it is far superior to polychrome methylene blue for metachromasia, and strongly recommends its use for pathological diagnoses. It cannot be employed for permanent mounts, but preparations in laevulose will keep their colour for a few days.

E. H.

TWORT (Frederick W.). **Further Modifications in the Preparation of Neutral Red-Light Green Double Stain, and an Improved Method of Embedding Tissues in Paraffin.**—*Brit. Jl. Experim. Path.* 1924. Dec. Vol. 5. No. 6. pp. 350–351. [1 ref.]

A modification of the method previously described [see this *Bulletin*, Vol. 21, p. 810] recommending the use of 60 per cent. normal propyl alcohol as a solvent for the stain instead of ethyl alcohol.

About 1 gm. of the solid dye is ground up with 100 cc. of the solvent and the solution filtered and kept in a stoppered bottle. When required for use it is mixed with an equal volume of water. 60 per cent. allyl alcohol may also be used as a solvent and produces the most dense and rapid staining solution. A saturated solution of butyl alcohol in distilled water will also dissolve the stain, producing a solution of use for demonstrating fine cellular structure. All the staining solutions stain more densely when used hot. A denser and faster stain is obtained by the addition of 1 per cent. or more of phenol, except in the case of butyl alcohol. With dry films, better results are obtained by treating them, after fixation, with such solvents as xylol, chloroform, or soft soap dissolved in 60 per cent. alcohol.

When preparing tissues for embedding in paraffin it is possible to eliminate the use of xylol, etc., by employing butyl alcohol both as a dehydrating and clearing agent, as it mixes well with both 50 per cent. ethyl alcohol and melted paraffin. The tissues after fixation are passed into 60 per cent. ethyl alcohol and then into pure normal butyl alcohol for 2 to 3 hours, during which the liquid is changed several times. They are then passed through changes of paraffin in the usual manner.

The author states that the tissues treated in this manner remain soft and show very little, if any, shrinkage. Moreover, the cellular structure remains free from distortion and contraction.

E. H.

PROESCHER (Frederick) & KRUEGER (Albert Paul). **A Simple and Rapid Method for the Preparation of Polychrome Methylene Blue and Thiazin Red.** [Methylen-azur.] **A Rapid Method for Staining Frozen Sections with Thiazin Red.**—*Jl. Lab. & Clin. Med.* 1924. Nov. Vol. 10. No. 2. pp. 153–159. [11 refs.]

Any good commercial brand of methylene blue, preferably *medicinale*, may be used for the preparation of the polychrome methylene blue. A 1 per cent. solution is prepared either in water, alcohol, acetone, or chloroform. 20–30 milligrams of sodium peroxide is then added to each 100 cc. and the mixture at once either boiled over a flame for 5 minutes, or placed in a water-bath at 100° C. for 15 minutes. If a neutral solution is desired, the free alkali may be neutralized by adding N/10 HCl (5 mg. Na_2O_2 require 1·18 cc. N/10 HCl). The solution should be kept in a paraffined bottle ; otherwise the alkali is liable to dissolve out of the glass.

Since the specific staining of this solution depends on the presence of thiazin reds, these may be isolated as follows. 50 gms. methylene blue are dissolved in 200 cc. water and the solution heated to 75°–80° C. 5 gms. sodium peroxide are dissolved in 20–30 cc. water, and added to the warm solution. Immediately the thiazin reds are precipitated and can be removed by filtering the cooled solution through a Buchner funnel and drying the precipitate at 37° C. After 24 hours the large lumps should be broken up in a mortar, and the compound dried again and finally desiccated over calcium chloride or concentrated sulphuric acid. A suitable staining solution may be prepared by dissolving 0·5 gm. of the dried precipitate in 100 cc. distilled water.

For the staining of frozen sections a solution in 1 per cent. acetic acid is recommended. 10 to 20 seconds in the staining bath is quite sufficient; then wash in water and mount in glycerine or laevulose syrup.

E. H.

Marie (Stanley U.) & Raleigh (Joseph T.). **The Use of Ultra-Violet Rays for the Polychromization of Methylene Blue.**—*Jl. Lab. & Clin. Med.* 1924. Dec. Vol. 10. No. 3. p. 250.

Dissolve 1 gm. of methylene blue in 100 cc. of a 0·5 per cent. solution of sodium bicarbonate in distilled water. Then expose the mixture in a shallow dish, to the ultra-violet rays from an ordinary arc lamp or similar source of light, for a period of ten to thirty minutes. When the mixture is cool, add slowly 500 cc. of a 0·1 per cent. yellowish eosin solution, when a fine black precipitate is formed. Filter off this precipitate and allow it to dry; then dissolve 0·1 gm. of the dry powder in 60 cc. of acetone-free methyl alcohol

E. H.

Conn (H. J.). **Certified Stains—What they are, and how to obtain them.**—*Jl. Lab. & Clin. Med.* 1925. Jan. Vol. 10. No. 4. pp. 321–322.

In the U.S.A. the difficulty of obtaining reliable biological stains has been met by the appointment of a "Commission on Standardization of Biological Stains." This Commission tests batches of stains submitted to it and then furnishes a special label bearing the statement "Found satisfactory by Commission . . ., etc. for $\left\{\begin{array}{l}\text{above mentioned purposes}\\ \text{purposes mentioned on main label.}\end{array}\right\}$ Use for other purposes not contra-indicated unless specifically so stated $\left\{\begin{array}{l}\text{above}\\ \text{on main label}\end{array}\right\}$."

The following stains have been put on a certification basis: Methylene Blue; Basic Fuchsin; Acid Fuchsin; Haematoxylin; Safranin O, and Pyronin. The following companies have received certification for some or all of these stains: Empire Biochemical Co.; Hartman-Leddon Co.; MacAndrews and Forbes; National Aniline and Chemical Co.; and Providence Chemical Laboratories.

E. H.

Popoff (Peter). **An Attempt at growing Pathogenic Protozoa by the Method of Collodion Sacks.**—*Jl. Trop. Med. & Hyg.* 1924. Sept. 15. Vol. 27. No. 18. pp. 247–248.

In order to cultivate malaria parasites the author mixes the defibrinated blood containing the organisms with 50 per cent. dextrose solution and puts the mixture into collodion sacs, which are then placed in large test-tubes or U-tubes containing normal saline, Ringer's, or Lock's solution. 50 per cent. dextrose solution is added to the blood mixture every four hours and also the saline or Lock's solution changed after the same interval. As a result the toxins produced in the cultures diffuse through the walls of the sacs and are removed, and in addition the food supply is easily renewed. The cultures are kept at 37°–39° C. or even 41° C. The method has been employed for other parasites, including *Trichomonas intestinalis* and Sarcosporidia, and the author recommends its general use for the growth of pure cultures of pathogenic protozoa.

E. H.

GRUHZIT (O. M.) & CLARK (L. T.). **A New Clinical Method for Blood Typing.**—*Jl. Lab. & Clin. Med.* 1924. Oct. Vol. 10. No. 1. pp. 66–68. With 2 figs. [6 refs.]

A simple method of testing the blood group of a patient, which can be performed by physicians at any place irrespective of laboratory facilities.

The two standard sera are contained in bent capillary tubes of the shape figured below (Fig. 1), and in order to avoid confusion the sera are put in different coloured capillaries. Before puncturing the patient's ear or finger, the tip of the empty end of the capillary is broken off, and then the tip of the end containing the serum. Then a rubber bulb, with a hole in it, which can be closed by the thumb of the operator, is placed on the empty end of the capillary. The second capillary is prepared in a similar manner. Then prick the patient's ear or finger, squeeze out a minute drop of blood and touch it for an instant with the ends of the capillaries containing serum. The smaller the quantity of blood, the better.

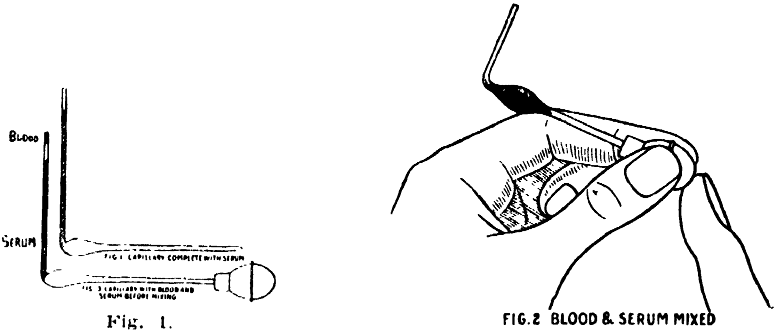
BLOOD
SERUM
FIG 1 CAPILLARY COMPLETE WITH SERUM
FIG 3 CAPILLARY WITH BLOOD AND SERUM BEFORE MIXING

Fig. 1.

FIG.2 BLOOD & SERUM MIXED

Illustrating a new clinical method for blood typing.
[Reproduced from the *Journal of Laboratory & Clinical Medicine.*]

By means of the rubber bulb the blood and serum are then drawn into the spindle enlargement of each capillary, and then driven out again, the process being repeated until the cells and serum are thoroughly mixed. The capillaries are allowed to stand for five to ten minutes, then reagitated. If the contents appear granular and the flocculation increases on agitation, it is an indication of agglutination. If desired, the contents can be examined under a microscope, but this is unnecessary.

E. H.

GORÉ (S. N.). **A Simple Method of preparing a Series of Tenth Dilutions.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 157–159. [1 ref.].

Two platinum loops are prepared, one 5 mm. and the other 1 mm. in diameter. Such loops take up approximately one-fortieth and one four-hundredth of a cubic centimetre of liquid, respectively, when biconvex loopfuls of liquid are removed.

The method of preparing tenth dilutions with these loops is as follows :—

Mark and serially arrange as many hollow slides as the number of required dilutions (for faeces three is usually enough) and by means of the 5 mm. platinum loop put one loopful of saline solution in each of the hollows in the slides. Then by means of the 1 mm. loop, remove a loopful of the faeces, or other material to be examined, and mix it well with the saline in the first hollow. This gives first tenth dilution. Without sterilizing the loop, remove a loopful from this first dilution and mix it with the drop of saline in the second hollow. This gives the second tenth dilution, and additional ones are prepared in the same manner.

Now sterilize the 1 mm. loop and take up a loopful from the last dilution and spread it well on an agar slope. Other inoculations are prepared in the same manner, but in reverse order, to obviate the necessity of sterilizing the loop after each inoculation. As the quantity of liquid spread on the agar slopes is very small (·04 cc.), it dries almost at once and therefore the tubes can be immediately plugged after inoculation and incubated.

The advantages of employing agar slopes instead of Petri dishes are twofold : less than a quarter of the amount of culture media is required, and the test-tubes can be stored for long periods without having to be prepared fresh or every day or two—as is the usual case in the tropics with media in Petri dishes.

E. H.

SHANKS (G.). **A Note upon Routine Blood Cultures.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 557–559.

The author recommends the routine practice of making a culture of the blood in all febrile cases at or near the time of onset of the fever.

The cultures are made in flasks containing 50 cc. of 2 per cent. glucose broth with 1 per cent. sodium citrate ; 10 cc. of blood are removed from the patient, of which 7 cc. are added to this medium, and the other 3 cc. kept for agglutination reactions. A table is given indicating the nature of the bacteria found in 65 cultures, and the conditions in which they were obtained, from which the diagnostic value of the method is evident.

E. H.

BROWN (H. C.), DUNCAN (J. T.) & HENRY (T. A.). **The Fermentation of Salts or Organic Acids as an Aid to the Differentiation of Bacterial Types.**—*Jl. of Hyg.* 1924. Sept. Vol. 23. No. 1. pp. 1–22. With 2 plates. [12 refs.]

The identification of certain types of bacteria by the " sugar reactions " is unreliable or breaks down in some cases, *e.g.*, the *Salmonella* group, and in dealing with such cases the authors recommend the substitution of certain organic salts for sugars. Another advantage of their use is the fact that they are cheaper and more easy to obtain pure than the rarer sugars, such as inositol and trehalose. A large number of organic salts were tested with various bacteria, but the reaction changes and production of gas were not sufficiently constant to form a reliable diagnostic criterion for the differentiation of bacterial types. In the majority of cases the enhancement or inhibition of growth bears a definite relation to the utilization of the salt by the bacteria. This furnishes a useful differential test for certain organisms when citrates are used, but cannot be applied in the cases of all salts.

The bacterial decomposition of the salts of those organic salts that form insoluble lead compounds can be demonstrated by the addition of lead acetate to the culture. By the use of the sodium salts of six organic acids (viz., citric, d-tartaric, l-tartaric, m-tartaric, fumaric and mucic), seven different groupings of the common *Salmonella* types can be obtained, whereas the sugar reactions up to the present have given only four groupings.

In addition, the organic salts form an easy method of distinguishing between some of the members of the *coli-aërogenes* group, and also between *B. diphtheriae* and Hofmann's bacillus, as well as between *B. mallei* and *B. whitmori.*

These six organic salts are relatively inexpensive, can easily be obtained pure, and also will stand sterilizing by the autoclave.

The nature of the decomposition products in the case of citric acid in the presence of *Bacillus suipestifer* was found to be acetic acid, carbonic acid and succinic acid. In the case of fumaric acid the acid seems to be converted into succinic acid by direct reduction, and an analogous reaction takes place in the case of maleic acid.

From the authors' experiments it seems that simple aliphatic monobasic and dibasic acids, with the exception of formic, are not readily decomposed by the bacteria investigated, and this is also true of monohydroxy-carboxylic acids. Readiness of decomposition is first shown by the tartaric acids and is at its best in citric acid.

E. H.

GORÉ (S. N.). **A Simple Method for the Classification of Aerobic Bacilli growing well on Ordinary Laboratory Media and a Key for the Provisional Identification of Certain Aerobic Non-Spore producing Intestinal Bacilli and Vibrios.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 161–177. [9 refs.]

A scheme for facilitating the classification and identification of aerobic bacilli and vibrios resembling the bacilli of the typho-colon group in their surface growth on agar. The organisms are divided up into six groups and forty-eight sub-groups, the classification being based on simple reactions obtained by culturing the bacteria in three media, viz., glucose peptone water, lactose litmus peptone water, and ordinary peptone water. The glucose and lactose cultures are examined for the presence or absence of partial or complete fermentation, the glucose culture being still further examined for the presence or absence of the carbinol (Voges Proskauer) reaction. The peptone culture is examined for the absence or presence of indol and of motility.

The bacilli are first divided into six main groups by means of their fermentation reactions and each of these split up into eight sub-groups by means of indol, carbinol and motility.

A mnemonic system is proposed for recording the characters thus obtained and gives diagnostic formulae for each group and sub-group. The negative characters are recorded by a zero, while the positive characters are recorded by letters. The partial and complete fermentation in glucose and lactose are indicated respectively by small (g) and (l), and capital (G) and (L); while the letters for indol, carbinol, and motility are capital (I), (C) and (M) respectively.

Thus the six main groups are as follows :—

(O) Bacilli which do not ferment glucose (O) and lactose (O).
(g) Bacilli which partially ferment glucose (g) but not lactose (O).
(gl) Bacilli which partially ferment both glucose (g) and lactose (l).
(G) Bacilli which completely ferment glucose (G) but not lactose (O).
(Gl) Bacilli which completely ferment glucose (G) and partially ferment lactose (l).
(GL) Bacilli which completely ferment glucose (G) and lactose (L).

The letters for the sub-group reactions are added to the above, giving in all 48 formulae. Thus, GICM would indicate that the organism completely ferments glucose (G), but not lactose, and, in addition, gives positive indol (I) and carbinol (C) reactions, and is motile (M). Tables are given of the micro-organisms belonging to each of the six groups, showing their sub-group formulae and other important reactions, from which it is very easy to obtain an identification of the bacillus under examination.

[Various schemes of classification have been proposed, such as CHALMERS and MACDONALD'S (1916), CASTELLANI and CHALMERS' (1918) and KHALED'S (1923), but the one outlined above seems to be the most satisfactory that has been put forward.]

E. H.

CUNNINGHAM (J.) & RAGHAVACHARI (T. N. S.). **Recent Methods of Differentiating Lactose Fermenting Organisms, as applied to Indian Conditions.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 75–81. [20 refs.]

The authors have studied the coliform bacteria found in human and bovine faeces, and also in a large series of samples of unfiltered water from various parts of the Madras Presidency, with the object of finding some classification which will afford evidence of the origin of such organisms in water. The methyl red (M.R.) and Voges Proskauer (V.P.) tests were employed, and the results of the examination of a very large number of lactose fermenting bacilli by these methods are given in tabular form, the organisms being classified as either low ratio (M.R.+V.P.—) or high ratio (M.R.—V.P.+) groups.

With regard to human faeces, 960 cultures taken from 91 stools were examined, and the percentage of the high ratio group was found to be 2·1, the figures from non-vegetarian and vegetarian sources, respectively, being 0·4 and 4·6. In bovine faeces the high ratio group forms 0·5 per cent. of the lactose fermenting organisms.

In unfiltered water, out of 2,455 cultures from 245 samples, 29·8 per cent. of the lactose fermenting bacteria belong to the high ratio group, and there is no substantial difference in the distribution of the two groups if the samples are divided according to their source (Rivers, surface water, springs, wells, etc.). These results agree with those obtained by other observers in different parts of the world, but up to the present this grouping method has not furnished any clue as to the probable source of organisms found in water.

E. H.

CASTELLANI (Aldo) & TAYLOR (Frank E.). **The Identification of Glycerol by a Bacterial Method.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 15. Vol. 27. No. 20. pp. 271–273. With 3 figs. [8 refs.]

An application of the authors' method of employing various strains of bacteria and fungi, with different fermenting properties, for the identification of various carbon compounds. The present article is mainly concerned with the identification of glycerol, but, in addition, a table is given showing the organisms employed for the determination of the following compounds: glucose, levulose, maltose, galactose, saccharose, inulin, and inositol. The results are stated to be relative, and "not absolutely certain"; it is essential to use only selected strains of the organisms with constant characteristics and producing a large amount of gas.

E. H.

GORÉ (S. N.). **A Simple Method for detecting and estimating Indican in the Urine by Means of the Cotton-Wool Plug Test.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 393–396. [4 refs.]

The author recommends a cotton-wool plug technique in place of Obermeyer's test for the detection of indican in urine. The author's method has been compared with Obermeyer's and found to be quite as accurate, in addition to being simpler, more rapid and economical, and independent of drugs taken by the patient. 2 cc. of the urine to be tested are put in a small test-tube (5 in. by ¾ in.) fitted with a white cotton-wool plug.

The plug is removed and moistened with a drop or two of a 1 per cent. solution of potassium persulphate in distilled water, followed by a drop of the following solution: p-dimethyl-amido-benzaldehyde 1 gm, absolute alcohol 95 cc., concentrated hydrochloric acid 20 cc. The moistened plug is then replaced and the urine boiled intermittently for about a minute. The presence of indican is shown by the development of a pink colour on the cotton wool. By diluting the urine with water to ½, ¼, ⅛ dilution, etc., and repeating the test, an indication is obtained, correct to within 5 per cent., of the amount of indican present, for the smallest quantity that will give a positive reaction with this test is 0·0005 mgm. of indol-equivalent per cc., and it is only necessary to multiply this figure by the last dilution which gives a positive reaction. For example, if an ⅛ dilution is the highest that gives a positive reaction the indol-equivalent of the indican present in the urine would be $0{\cdot}0005 \times 8 = 0{\cdot}004$ mgm. per cc. of urine.

E. H.

NEWHAM (H. B.), WILTSHIRE (H. G.) & SCHARFF (J. W.). **The Estimation of Haemoglobin.**—*Jl. Roy. Army Med. Corps.* 1924. Nov. Vol. 43. No. 5. pp. 359–365. [9 refs.]

A useful article on the various methods of estimating the amount of haemoglobin in blood. The usual practice is to employ one of the various colorimetric methods, but a comparison of the haemoglobin content of 30 patients estimated by the Gower, Haldane, Tallquist, and Fleischl haemoglobinometers, respectively, with the results obtained by Van Slyke's method of estimating the oxygen carrying capacity of the blood, showed in most cases serious discrepancies. All four haemoglobinometers were found to be unreliable, but as a general rule the figures obtained by the colour methods were much lower than those with Van Slyke's method, and the authors consider that the commonly accepted standard of 100 per cent. representing 13·77 gms. of haemoglobin per 100 cc. of blood, as used in the above-mentioned instruments, is far too low. The normal standard seems to be about 108 to 110 per cent., equivalent to about 15 gms. of haemoglobin in each 100 cc. of blood, this figure being based on the examination of 14 healthy individuals.

The specific gravity is sometimes used as a measure of haemoglobin, but the measurement of 15 cases by this method showed some very marked differences from the results obtained by Van Slyke's.

The haemoglobin content was also found to vary (up to as much as 14 per cent.) in the same individual at different times of the day; consequently it is recommended that when making comparative estimations the blood should be collected at approximately the same hour on each occasion.

E. H.

HUGHES (T. A.). **Observations on the Bilirubin Content of the Blood Serum.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 403–408. [8 refs.]

Employing MCNEE's technique* the author has estimated the bilirubin content of 41 persons, 34 of whom were hospital patients. For comparison the urobilinogen in the urine was also estimated, both series of results being given in tabular form. The bilirubin content of normal serum was taken as 0·3 to 0·6 "van den Bergh" units (1 in 200,000). Four cases of hepatic cirrhosis with enlargement of the spleen and ascites showed the presence of latent haemolytic jaundice, but in addition more than half the patients showed a similar condition, probably as a result of latent malaria.

E. H.

GILBERT (Ruth) & PARSONS (Ellsworth A.). **The Use of Defibrinated Blood preserved with Formaldehyde for the Purpose of controlling Dilutions of Dried Blood.**—*Jl. Lab. & Clin. Med.* 1924. Dec. Vol. 10. No. 3. pp. 206–207. [1 ref.]

In order to estimate the amount of blood in dried blood sent in for agglutination tests, it is necessary to dissolve it and compare the colour with blood of known dilution. The authors find that defibrinated sheep's blood, to which 5 per cent. formalin has been added in the proportion of 1 cc. to each 20 cc. of blood, may be used for preparing dilutions, and during a period of two weeks these compared satisfactorily with accurate dilutions of freshly drawn human blood. Another specimen remained satisfactory for a period of four weeks.

E. H.

WALLACE (J. B.). **The Differential Leucocyte Count in a Sub-Tropical Climate.**—*Southern Med. Jl.* 1924. Nov. Vol. 17. No. 11. pp. 827–829. [3 refs.]

Tables are given illustrating the leucocyte count of 100 consecutive hospital cases in South Florida, Jenner's stain being employed. The results indicate that the normal polymorphonuclear percentage is decidedly lower than that usually given, the majority of cases having a percentage between 50 and 60, with extreme normal variations from 42 to 70 per cent. The average small lymphocyte percentage was usually from 30 to 40, with normal variations from 25 to 47 per cent. The average total number of leucocytes was 7,830.

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* *Quart. Journ. Med.* Vol. 16. p. 390.

[These results agree with others made in the United States, and suggest that EHRLICH'S original figures show too high a percentage for the polymorphonuclears in normal blood.]

E. H.

EMRYS-ROBERTS (E., The late). **The Normal Differential Leucocyte Count in South African Natives, Chinese and Others.**—*Jl. Path. & Bact.* 1925. Jan. Vol. 28. No. 1. pp. 119–122. With 5 figs. [2 refs.]

A series of charts of the leucocyte counts of Africans, Chinese and British, illustrating the prevalence of polymorphonuclears, lymphocytes, large hyalines, eosinophiles and mast cells, respectively. The results support the author's view that the leucocyte counts may have an important bearing on anthropological research, for wide variations are observed between the different races. In the case of polymorphs the average percentage proportion was about 60–70 for British, 40–45 for Africans, and 38 for Chinese. The proportion of eosinophiles was identical in all three races (3 per cent.), but the other varieties of leucocytes all showed variations.

E. H.

STEWART (Marguerite). **Blood Transfusion as adapted for Use in India.**—*Jl. Assoc. Med. Women in India.* 1924. Aug. Vol. 12. No. 3. pp. 17–22.

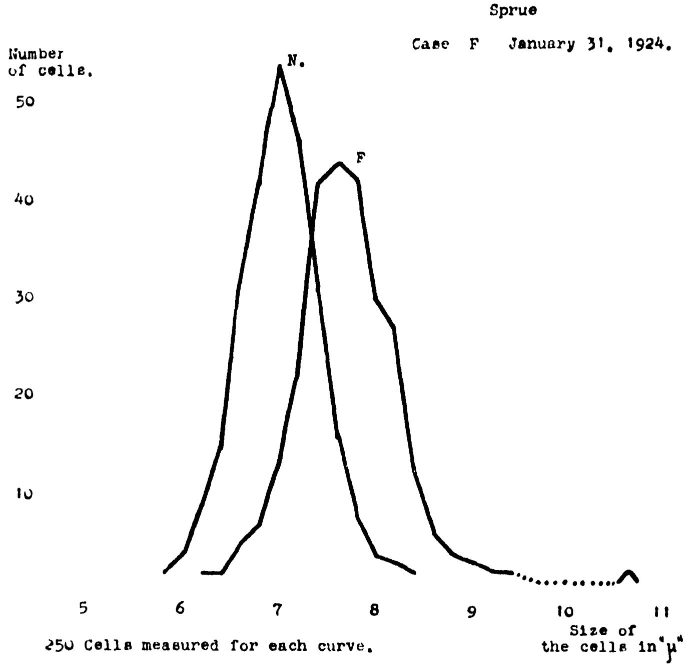
Contains an account of seven cases in which the indirect transfusion of citrated blood was performed, together with a description of the general technique. Owing to the difficulty of obtaining standard sera in India, the direct method of testing the compatibility of bloods was employed and found to be satisfactory. For Indian women, who usually have very small veins, the needles and canulae for the operation require to be of very small size.

E. H.

PASSEY (R. D.) & BRAINE (J. Carter). **Measurements of the Red Cells in the Anaemias of Sprue and *Dibothriocephalus latus* Infection.**—*Guy's Hospital Reports.* 1924. July. Vol. 74. (Vol. 4. 4th Ser.) No. 3. pp. 329–338. With 7 charts in text. [5 refs.]

The authors have measured the size of the red cells in five cases of sprue and four cases of infection with *Dibothriocephalus latus*, to see if they showed the megalocytic phenomena which PRICE-JONES has shown to be constant factors in the blood in pernicious anaemia.

The measurements of the red cells from the sprue patients showed a definite deviation from the normal in three cases and a slight deviation in the other two. The average mean diameters of the cells were $8{\cdot}17\mu$, $7{\cdot}72\mu$ $7{\cdot}89\mu$, $7{\cdot}10\mu$ and $7{\cdot}40\mu$, respectively, as compared with a normal mean of $7{\cdot}00\mu$.



250 Cells measured for each curve.

Curve N represents a normal curve for comparison.

Average diameters :- Curve N. 7.00
Curve F. 7.72

Curve of Measurements of the Red Cells from a Sprue Patient compared with a Normal Curve.

[Reproduced by permission from *Guy's Hospital Reports.*]

In all four cases where the patients were harbouring the tape-worm, definite enlargement of the red blood corpuscles was demonstrated, and the cell distribution curves showed some widening of the base of the curve, together with a movement towards the right. Three of these cases were infected experimentally by swallowing the plerocercoid stage of the parasite and in these it was possible to measure the cells immediately after infection, during the experiment and at the end. In two cases measurements were also made several months later.

The increase in size of cells was as follows :—

Case 1 from 7·02μ at the beginning to 7·68μ at the end, returning to 7·18μ after fifteen months; case 2 from 7·03μ at the beginning to 7·38μ at the end, returning to 7·00μ after 9 months; case 3 increased from 6·96μ to 7·17μ; and case 4 was 8·04μ when infected and 38 days after treatment returned to 7·66μ. No other blood changes were observed beyond those recorded above.

[Although the factor of diurnal variations in the size of the red blood cells was to some extent eliminated by the patients' blood being collected at the same time each day, it should be remembered that other factors are capable of producing these changes, such as violent exercise, forced breathing, etc. The experiments of PRICE-JONES* suggest that variations in the size of the red cells are due to differences in the reaction of the blood, an increase of acidity causing them to swell, whilst abnormal alkalinity has the opposite effect.]

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* *Jl. of Path. & Bact.* 1920. Vol. 23. p. 370.

E. H.

GIBBS (Charles S.). **An Improvised Autoclave for Hospital Laboratories.**—*China Med. Jl.* 1924. Nov. Vol. 38. No. 11. p. 920. With 2 figs.

The difficulty of heating autoclaves in a remote station in China was overcome by raising the stand by the addition of a strip of metal 3 inches wide and cutting a door in the stand in order to allow the introduction of an improvised fire-box. The latter was made by cutting off an old carbide tin 7 inches from the bottom. This tin was then filled with concrete except for a rectangular fire-box 4 inches by 6 inches, the grate of which was made by fitting ¼ inch steel rods into the concrete, about ¼ inch apart and 3 inches above the bottom of the tin. A ¾ inch tube was then forced through the concrete to open below the fire grate and connected at the other end with bellows. A charcoal fire was lighted and the fire-box placed underneath the autoclave. By means of the bellows the rate of the fire can be regulated, and the pressure of the autoclave can be raised to 30 pounds in 10 minutes, or 50 pounds in 15 minutes.

E. H.

REMLINGER (P.) & BEL (P.). **Inoculation des animaux par voie transorbitaire.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 192–202. With 1 fig. [3 refs.]

The author describes the shape of the orbit in the following animals: dog, cat, horse, pig, sheep, goat, cattle, rabbit, guineapig, rat, fowl, frog and fish. In each case the shape is only considered from the point of view of introducing a needle into the optic foramen, in order to effect intra-cerebral injections without having to resort to trephining.

In the case of the rabbit this method of injection has been used for infecting them with rabies, but the results were not very satisfactory, owing to the fact that one is liable to mistake a foramen in the interorbital septum for the optic nerve, and therefore merely pass the needle into the opposite optic cavity when performing an injection. Employing guineapigs, in which there is no chance of this mistake, the intra-orbital method of injection with rabies gave 100 per cent. of infections.

When performing this operation an ordinary needle is employed, and it is essential to fix the head of the animal, as sudden movements after the introduction of the needle are liable to produce fatal injuries. The passage of the needle into the optic nerve might have been expected to produce some kind of injury to the sight, but the authors inoculated 0·5 to 1 cc. of 20 per cent. urotropine into a number of guineapigs every other day, alternately by the right and left orbits, and the animals showed no ill effects after ten injections. Moreover, careful examination with an ophthalmoscope failed to reveal any difference between an inoculated eye and a normal one.

Finally, the authors discuss the possibility of this method of inoculation being performed on man, especially for the introduction of medicaments, in the case of patients suffering from affections of the central nervous system, such as syphilis, sleeping sickness and encephalitis lethargica. Moreover, they recommend its use for the intra-cerebral injections of anti-tetanic and anti-meningococcic sera.

E. H.

LABORATORY REPORTS.

ASSAM. **King Edward VII. Memorial Pasteur Institute, Shillong. The Seventh Annual Report, for the year ending 31st December, 1923.** [GREIG (E. D. W.), Director.]—27 pp. 1924. Shillong: Govt. Press. [Price 12 annas.]

During the year 2,371 persons were treated for hydrophobia, of whom 22 died, 12 dying more than 15 days after completing the treatment. Accordingly, the total hydrophobia rate was 9·93 per cent. and failure rate 0·51 per cent. Particulars are given of the treatment of 84 cases of kala azar; 29 were treated by urea stibamine alone, 7 cases by tartar emetic and afterwards by urea stibamine, 2 cases with Bayer "205" and afterwards urea stibamine, 1 case with urotropine and afterwards tartar emetic, and 45 cases with tartar emetic alone. 65 of these patients were discharged as cured, urea stibamine being the most effective drug. Bayer "205" and urotropine were found to be useless.

Diphtheria. The examination of children at the European schools in Shillong by the Schick test was continued throughout the year, and all those found to be susceptible were immunized with toxin-antitoxin. This is a continuation of work begun last year (1922) by Major MACDONALD, I.M.S. (see this *Bulletin*, 1923, Supplement No. 3, p. 200), and its success is shown by the fact that during the present year no cases of diphtheria occurred in the schools. This is the first time since 1917 that they have been free from infection.

The throats of 242 children were examined by culturing swabs, and 16 were found to be carriers of *B. diphtheriae*, 4 being virulent and 12 non-virulent strains.

E. H.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1923.** [MACKIE (F. P.), Offg. Director.]—49 pp. With 3 charts. 1924. Bombay: Govt. Central Press. [Price As. 14 Ps. 6.]

A considerable part of this Report is concerned with plague and will be dealt with elsewhere.

With regard to the research work of the laboratory, most of the results have been published elsewhere and already received notice, but the following observations appear only in this report:—

Lt.-Col. F. P. MACKIE, I.M.S., and Dr. G. D. CHITRE, L.M. & S., examined the bodies of 27 *Mus rattus* and 23 *Mus decumanus*, without finding a single example of either *Spirochaeta* [*Leptospira*] *icterohaemorrhagiae* or *S. morsus muris*. In view of the prevalence of rat-bite fever in Bombay, these negative results are rather surprising.

Guinea-worm Disease. Dr. FAIRLEY has continued researches on Dracontiasis and gives some notes on the action of various digestive secretions on infected Cyclops. LEIPER'S observation of the stimulating action of hydrochloric acid on the émbryos was abundantly confirmed, but the survival time was limited. In the presence of sodium bicarbonate and liquor pancreaticus the embryos showed normal motility, even after seven hours, so it is evident that they would be able to invade the gut wall after passing from the stomach into the duodenum or jejunum. Twenty-two monkeys (*Macacus sinicus*) were subjected to different modes of infection with uniformly negative results after twelve to fourteen months, so this species seems to be naturally immune to guinea-worm disease. In conjunction with Major J. MORISON, I.M.S., a series of experiments were made to determine the best means of killing Cyclops in drinking water. Alum, copper sulphate and chlorine were unsatisfactory, but lime (1 lb. per 1,000 gallons) was found to be practicable.

Bilharziasis. Twenty-five cases of vesical bilharziasis (*S. haematobium*) from Mesopotamia, that had undergone a course of intravenous treatment with tartar emetic, after twelve months showed practically no change in their serological reactions, the anti-body still persisting. The majority of these cases showed no clinical relapse, but five continued to pass living ova in the urine.

The antigen prepared by making a concentrated alcoholic extract of the livers of *Planorbis exustus* infected with *Schistosoma spindalis* was found unchanged after storage for twelve months in an ice-chest. This antigen gives a group reaction and can be used for detecting other forms of mammalian bilharziasis, including the three species infecting man.

The possibility of a serological classification for bilharzial cercariae is suggested by the fact that the serum from a case of *S. haematobium* infection reacts with the livers of snails infected with such divergent cercariae as *S. mansoni* and *S. spindalis.* The same serum, however, failed to give any reaction with extracts derived from non-bilharzial furcocercous cercariae and also from various non-furcocercous species.

The claims of DIAMANTIS regarding the efficacy of emetine hydrochloride have been confirmed, and the author states "undoubtedly emetine hydrochloride will ultimately replace tartar emetic in the treatment of the various forms of mammalian Bilharziosis."

Rabies. In India about one person in a hundred who have undergone a complete course of treatment die of hydrophobia. Major MORISON has attempted to eliminate this failure rate by giving seven days' intravenous injections, followed by seven days' subcutaneous ones. His results are inconclusive, but 720 intravenous injections were given to 169 patients without a single accident or any alarming symptom. The general results of anti-rabic treatment are given in an appendix to the report.

E. H.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH. **Annual Report for the Year ended 31st December, 1923.** [WATKINS-PITCHFORD (Wilfred), Director.]—48 pp. With 2 plates. 1924. Johannesberg: Published by the South African Institute for Medical Research, P.O. Box. 1038.

Research Division. Thirty-six strains of *Meningococcus* from natives, all obtained from cerebro-spinal fluid, were investigated as to their type classification. 7 strains corresponded with Gordon's Type III, and 25 with Lister's Group E, whilst 4 were aberrant. Somewhat similar results were obtained with 23 strains of the organism from Europeans, only 1 strain corresponding with Gordon's Type I. The disappearance of this type is noteworthy, as in previous years it was one of the most prevalent. [See this *Bulletin*, Vol. 20, p. 511.]

Filter-passing organisms were isolated from cases of *Epidemic*

Influenza and *African Horse-sickness*, and sent to the Rockefeller Institure, where OLITSKY reported that the former corresponded in its morphology with the filter-passers isolated from influenza cases in America. The organism isolated from the blood serum of horses suffering from horse-sickness is stated to be hitherto undescribed, but seems to belong to the same group as *Bacterium pneumosites*, the filter-passer from cases of epidemic influenza. The inoculation of a culture of the organism, grown in Noguchi's medium, produced illness in horses, and the symptoms were not unlike those of horse-sickness. One of these horses was afterwards inoculated with 2 cc. of a known virus of horse-sickness and at once succumbed to the disease.

Taeniasis. It is recommended that if a carcase contains not more than ten bladder-worms, and these are not widely distributed, the cysticerci should be removed, and the parts not affected passed as fit for human consumption, after being kept at a temperature not higher than 10°C. for at least twelve weeks by, or under the supervision of, the Local Authority. This recommendation has been approved by the South African Parliament.

Ascariasis The work of STEWART and others on the life-history of Ascaris has been confirmed. The presence of massive infestations is recorded, some of which give rise to intestinal obstruction. Two of these cases contained respectively 990 and 899 worms, the proportion of male to female being 3 to 7 in the first and 1 to 6 in the second.

Schistosomiasis. Certain species of the water snail *Isidora* were experimentally infected with *S. haematobium.* A cinematograph film of the life-history of the parasite has been prepared and sent to the British Empire Exhibition.

Infective Silicosis. Guineapigs have been exposed to different concentrations of various dusts and have then been given either intraperitoneal inoculations of tubercle bacilli, or intra-tracheal inoculations of pathogenic cocci, particularly pneumococci. The results show that guineapigs that have inhaled phthisis-producing dust after either of these two inoculations may develop a lung condition comparable to that met with in miner's phthisis. Normal guineapigs inoculated intra-tracheally with pathogenic cocci either die within 48 hours or completely recover. Those that receive a similar inoculation after exposure to phthisis-producing dust either die within 48 hours or, in the majority of cases, develop a fatal, chronic, unresolving pneumonia.

Rats kept in cages underground do not live more than eighteen months, and in many cases die of pulmonary tuberculosis.

Industrial Hygiene. An investigation of the methods and results of dust-sampling in mines has now been completed, and the question of underground ventilation is being studied in a test-tunnel on the "Village Deep Mine."

Routine Division. The increase in the work of this division is shown in a table giving the returns of the past ten years, 9,091 examinations in 1914 and 35,537 in 1923. Diphtheria was fairly prevalent throughout the year, but positive findings were definitely more numerous between March and September. 318 faeces showed *Entamoeba histolytica* in 98 cases, and pathogenic bacilli of the dysentery group in 28. As in previous reports, attention is called to the fact that many typhoid cases never give a positive Widal reaction. A complement fixation test has been found to be a more reliable method of diagnosis. A complication in interpreting agglutination tests is shown in the case of typhus, which may give an agglutination with, say, *B. typhosus* in dilutions of 1 : 100 or even 1 : 200 before it gives any agglutination with *B. proteus* × 19, and in doubtful cases no reliance can be put upon a single test.

The results of using biliated typhoid vaccine given by mouth suggest that as far as three epidemics were concerned this method is at least comparable with the ordinary T.A.B. vaccine inoculated in the usual way.

Undulant fever shows a marked increase, 686, as compared with 196 in 1922, but in many cases the diagnosis was very uncertain. Burnet's intradermal test was used in a few cases and the opinion formed that it was as reliable as the agglutination test, but not more sensitive. Tartar emetic is now used for the treatment of schistosomiasis, with very satisfactory results. Amongst surgical cases sent in for report, six appendices and one Fallopian tube contained ova of schistosoma, their presence being, apparently, the sole condition leading to the removal of these organs.

E. H.

GOLD COAST. **Reports on the Medical Research Institute from January 1st, 1922, to March 31st, 1923.**—*Rep. Med. Dept. Gold Coast, January, 1922–March, 1923.* pp. 28–29. [CORSON (J. F.)]; 65–77 [INGRAM (A.)]

Most of the original work has been published elsewhere, and it is only necessary to refer to the routine examinations. An outbreak of relapsing fever occurred during the year, this being the first recorded in the British West African Colonies, although it has been observed by the French in the Haut Sénégal and Niger [see this *Bulletin*, Vol. 20, p. 132]. Inoculations of infected blood were made into rats and monkeys, but only the latter proved susceptible and then showed a very slight infection with no relapses. Attempts to transmit the disease by bugs and mosquitoes proved unsuccessful, and since *Ornithodorus moubata* and *O. savignyi* do not occur and *O. talaje* is very rare, it is probable that the carrier is *Pediculus humanus*. Six specimens of *Loa loa* were removed from the conjunctivae of natives at Quittah, where this parasite seems to be commoner than in the more westerly parts of the colony.

The examination of rats showed that *M. rattus*, which in 1908 was a rare species, is now the most prevalent, and *M. decumanus*, which was the commonest in 1908, is now the rarest of the three species. Out of 286 rats there were 151 *M. rattus*, 117 *Cricetomys gambianus*, and 18 *M. decumanus*. The records of fleas taken on the rats show that the prevalent flea on *C. gambianus* is not *Xenopsylla cheopis*, but *X. aequisetosus*. *X. astia** was found upon *M. decumanus* and *C. gambianus*, this being the first record of its occurrence in Africa.

The examination of samples of mosquito larvae showed that *Aëdes argenteus* (*Stegomyia fasciata*) is by far the commonest species (85·4 per cent.). The interesting suggestion is made that an increased percentage of this species occurs with a reduction in the rainfall, and the following table supports this view :—

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* This attribution has since been corrected. Mr. F. S. Cox has identified the fleas as the closely allied *Xenopsylla nubicus* Rothsch. (EVANS, *Ann. Trop. Med. & Parasit.* Vol. 18. p. 413.)

The Relationship of Rainfall and the Commonest Species of Mosquito Larvae found in Samples submitted by the Sanitary Department.

Year.	Rainfall in inches.	Number of samples of mosquito larvae submitted.	Percentage occurrence of the six commonest mosquitos found in the samples submitted.					
			Aëdes argenteus.	*Culex fatigans.*	*Culex decens.*	*Culex thalassius.*	*Lutzia tigripes.*	*Anopheles costalis.*
1917	42·2	457	77·3	22·8	0·4	0·4	0·4	1·0
1918	32·37	637	78·7	17·52	5·42	1·35	0·15	5·6
1919	20·4	801	90·6	11·0	1·2	0·6	0·4	1·0
1920	15·87	700	91·4	11·1	0·3	0·4	—	0·1
1921	34·43	532	71·6	22·9	1·8	2·6	2·2	2·2
1922–23	26·53	781	85·4	9·85	1·1	2·8	0·2	1·9

A survey of the Accra District for tsetse was conducted during August and September, the results mainly corresponding with those obtained by Dr. J. J. SIMPSON in 1912. Apparently only two species inhabit the Accra plain, namely *G. palpalis* and *G. longipalpis* and neither is found within a radius of 7–8 miles from Accra.

E. H.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Rapport sur le fonctionnement du Laboratoire de Léopoldville pendant l'année 1923.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 231–245.

The number of cases examined for trypanosomiasis during the year was 15,332, of which 7,015 underwent gland puncture, 341 lumbar puncture, and in 2,048 the blood was examined after triple centrifuging. The number of positive cases was 186, *i.e.*, 1·2 per cent. of those examined. During the year 1923 there were 253 patients suffering from this disease in the hospital at Léopoldville. Of these, 57 died, 53 went out for external treatment, 19 left the hospital and 22 were discharged as apparently cured.

The prevalence of trypanosomiasis in the Léopoldville Territory remains fairly constant, as shown by the following figures :—

1920, 3,630 examined, of whom 70 infected = 2 per cent.
1922, 2,435 " " 42 " =1·7 " "
1923, 2,060 " " 43 " =2·1 " "

In West Léopoldville 4,018 were examined during 1923, and 28 found to be infected, *i.e.*, 0·62 per cent.

With regard to syphilis the Bordet-Wassermann reaction was employed in 1,413 cases, of which more than half were positive. The flocculation method of Sachs-Georgi was employed in 178 cases, but gave many doubtful reactions.

The following helminths were obtained from autopsies performed at the laboratory during the year :—

Metastrongylus brevivaginatus & *M. salmi* from the lungs of a native pig ; *Labiduris africana* from the intestine of a terrestrial tortoise ;

Subulura distans from the intestine of a *Cercopithecus*; *Physaloptera Vandenbrandeni*, intestine of wild cat; *Stephanurus dentatus*, lungs of pig; *Oesophagostomum columbianum*, *Bunostomum trigonocephalum*, and *Trichuris globulosa*, from intestine of a goat; *Ancylostoma caninum*, *Uncinaria stenocephala* and *Dipylidium sexcoronatum* from intestine of a dog.

Malaria. The incidence of malaria in the district is shown in the results of the examination of 512 children from 12 villages. Of these 360 showed enlargement of the spleen, 173 carried the quartan parasite, 220 the tertian, and 98 showed gametes. Similar results were obtained from the examination of other localities. *Anopheles costalis* is by far the most common mosquito.

Treatment of trypanosomiasis. The results obtained with Bayer "205" are noticed elsewhere (see *ante*, p. 135). Tryparsamide "A 63" is said to be the most active arsenical compound employed up to the present. In the case of patients who gave a normal lumbar puncture, all those treated were cured [number not stated], but the authors state that this was probably a lucky series of cases. The drug possesses the grave disadvantage of causing visual trouble in certain cases. Stovarsol has been employed in large doses given by mouth, one patient receiving 46·5 grams in 26 days without any ill effects. Its therapeutic value has not yet been sufficiently tested.

Yaws. Intravenous or intra-muscular injections of potassium and sodium tartro-bismuthate are very effective in the treatment of this disease, and no toxic effects were noticed after their use, except in two cases of syphilis. The compound, however, employed in these two cases was not neutral. Various other bismuth compounds were also used with success. Stovarsol administered by mouth is said to be as efficacious as injections of arsenobenzol.

E. H.

DIACONO (H.). **Fonctionnement du laboratoire régional de Sousse (Année 1923).** *Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 238–241.

Contains records of the serological examination of the registered prostitutes at Susa and Kairwan. Since the institution of this anti-syphilitic service at Susa, the number of positive reactions has diminished from 69 per cent. in July, 1921, to 17 per cent. in 1923. At Kairwan the service was only commenced on Dec. 30th, 1922, and the number of positive sero-reactions during 1923 was 62·1 per cent.

E. H.

CILENTO (R. W.), MCINTOSH (R. D.) & CHARLTON (N. B.). **The Diagnosis of Bowel Diseases in Northern Australia. A Preliminary Compilation and Review.**—*Commonwealth of Australia Dept. of Health Service Publication (Tropical Division) No.* 5. 1924. 84 pp. With 4 plates and 3 figs.

This useful volume is mainly a compilation of recent advances in our knowledge of the commoner intestinal diseases liable to occur in Northern Australia. It includes chapters on uncinariasis, sprue, the dysenteric group, the bacterial fauna of the normal intestine, the pathogenic fauna of the intestine, the technique of laboratory identification of intestinal bacilli, the agglutination reaction, and the microscopic and macroscopic examination of stools. Figures are given of the ova of the common parasitic worms of man.

E. H.

BENSTED (H. T.). **Laboratory Work in Turkey, 1920-1923.**—*Jl. Roy. Army Med. Corps.* 1925. Feb. Vol. 44. No. 2. pp. 122–129.

The three main causes of disability during this period were acute diarrhoea, malaria and venereal disease, and these three disease conditions provided the main work of the laboratory. Dysentery and diarrhoea cases were examined by emulsifying a suitable portion of the faeces in saline, and inoculating directly on to MacConkey or litmus lactose media. Part was also examined microscopically, but extremely few cases of amoebic dysentery were observed and all gave histories of previous attacks in other places. In 237 successive cases of acute diarrhoea with blood and mucus, Flexner group was found 156 times; Morgan group 39, Schmitz group 30, and Shiga group 12 times.

With regard to malaria, the majority of cases were benign tertian, but malignant occurred in the following proportions: 1921, 1·5 per cent., 1922, 9 per cent. and 1923, 8 per cent. Quartan was observed on seven occasions.

For the diagnosis of syphilis, dark ground examinations for the spirochaetes were carried out in a central laboratory. The serum from any penile sores was collected in capillary tubes and forwarded to the laboratory for examination, and, if negative, another specimen was sent 24 hours later. The results obtained justified this procedure.

Sand-fly fever was practically confined to two barracks and each late spring and summer occurred large numbers of cases of this disease.

Paratyphoid infections were far more common than typhoid owing to the high inoculation state of the Army. The routine method of diagnosing the enteric group was cultivation in pure ox-bile. Gall bladders were obtained at the slaughter-house and after being taken to the laboratory the bile was removed aseptically into sterile flasks. It was found that after sterilization the bile was not such an efficient medium. The bile, after being tested for sterility, was filled into serum flasks which were distributed to each hospital. After 5 cc. of blood from the patient had been introduced into the tube at the bed-side, the flask was re-closed with sealing wax and forwarded to the laboratory. Paratyphoid A was the most difficult to cultivate from the blood, and frequently diagnosis had to be made upon a series of agglutination tests, and recovery of the organisms from the faeces, etc. Paratyphoid B grew readily in blood culture and also paratyphoid C, but the latter infection disappeared after 1920, when the original Salonica force was replaced by fresh troops.

A curious type of jaundice occurred in the summer months, which was far more common among the officers and officers' wives than amongst the troops. The disease was always preceded by a short pyrexial period, which subsided three to seven days before the jaundice appeared. The symptoms and colour cleared up very quickly in all cases. There was a slight early leucocytosis (10,000 per cmm.) with a relative increase of 6 to 9 per cent. in the large mononuclears. Urine, faeces and blood examinations were carried out with negative results, and triple centrifugation of the blood and dark ground examination failed to show any spirochaetes.

The Weil-Felix reaction was carried out in all cases of suspected typhus and every case that gave a positive clinical picture gave a positive reaction. A culture of *B. proteus* X. 19 obtained from the Austrian Hospital at Constantinople was employed. It was rare to obtain a positive reaction before the 6th day of the disease, but by the 8th to 9th day the titre was usually 1–500.

E. H.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1924. Vol. 64. No. 5. pp. 756–782.—**Jaarverslag van de Landskoepokinrichting en het Instituut Pasteur te Bandoeng over het jaar 1923.** [Annual Report of the Parc Vaccinogene and the Pasteur Institute at Bandoeng for the Year 1923.]

The institute was transferred from Weltevreden to Bandoeng in the beginning of 1923.

The total production of lymph amounted to 22,181 kg. (from 82 buffaloes); of 980,947 vaccinations, on an average 96·5 per cent. of those controlled were successful.

558 patients underwent antirabic treatment (excluding cases in which such afterwards proved to have been unnecessary); three patients died from lyssa, two during, one immediately after the cure.

The report further contains figures on the quantities of vaccines and sera supplied by the institute.

W. J. Bais.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1924. Vol. 64. No. 5. pp. 783–814. **Uit het Jaarverslag van het Centraal Militair Geneeskundig Laboratorium over het jaar 1923.** [From the Annual Report of the Central Military Medical Laboratory for the Year 1923.]

From the various matters contained in this report, the following may be mentioned.

The percentages of leucocytes in blood specimens in Java were found to differ from European figures. The normal standard was determined for clinical purposes as follows: basophilic 0·5 per cent., eosinophilic 3·5 per cent., large mononuclear cells 6 per cent., lymphocytes 40 per cent., neutrophiles 50 per cent. (4 per cent. with rod shaped, 46 per cent. with segmented nucleus).

An aid to the differential diagnosis between tertian and subtertian schizonts in the thick drop may be the fact that the red blood corpuscle containing a tertian parasite remains visible, more or less, notwithstanding the haemolysis.

W. J. Bais.

MISCELLANEOUS.

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK. **University Extension and School of Medicine in Co-operation with the Insular Government of Porto Rico. School of Tropical Medicine. Eight Months' Course for Qualified Graduates in Medicine. Given at New York City and San Juan, Porto Rico, Sept. 25, 1924, to May 30, 1925.**—7 pp.

Conjunctionally with the Government of the island of Porto Rico the Columbia University of New York has established a School of Tropical Medicine in San Juan in that island. Though Porto Rico is considered healthy, the death-rate being not more than 21 per 1,000, it has enough of tropical disease—malaria, dengue, yaws, uncinariasis, filariasis, schistosomiasis, sprue, mycosis, etc.—to make it interesting and instructive. The school course covers a term of eight months. The fundamental biological and chemical subjects will for the present be studied at the Columbia University ; the tropical medicine, surgery, and sanitation—which last will include field work in hook-worm and malaria control and field experience generally—will be carried on in the island.

A. Alcock.

MATIGNON (J. J.). **Nombre de coloniaux étiquetés hépatiques, à cause de leur teint, sont, avant tout, des intestinaux intoxiqués.**—*Progrès Méd.* 1924. June 28. No. 26. pp. 395–398. [3 refs.]

The author draws attention to the numerous old tropical residents who by reason of their complexion are regarded as " hépatiques." In many instances the bowel is the source of their complaint ; the apparent jaundice is not a real jaundice, for careful examination shows that the conjunctiva is spared and the urine does not react to Gmelin's test. A further proof is that they rapidly improve under treatment with Chatel-Guyon water and completely recover ; such a case is described. The abdomen is usually sensitive to pressure, there is putrefaction or fermentation of the gut contents, and often an increase in the volume of the liver, which, however, quickly yields to simple treatment. The cause of the earthy tint is red cell destruction produced by haemolysins absorbed in excess from the bowel. The liver is unable to cope with the blood destroyed, and haemoglobinaemia results.

A. G. B.

BAIS (W. J.). & VERHOEF (A. W.). **Het verschijnsel der iso-haemagglutinatie en de anthropologische beteekenis daarvan.** [The Phenomenon of Iso-Haemagglutination and its Anthropological Significance.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 6. 2nd Half. No. 10. pp. 1212–1231. With 1 fig. [32 refs.]

The authors have examined the blood of the native and immigrant Asiatic population in a part of Eastern Sumatra (Siantar) for the presence of agglutinable erythrocytes of the type A and B, and of the iso-agglutinins a and b. Using the groups of JANSKY, viz.:

Group I.—Neither A nor B present; *a* and *b* present,
Group II.—Presence of A and *b*,
Group III.—Presence of B and *a*,
Group IV.—Both A and B present; *a* and *b* absent,

they find, among 1,346 Javanese, a biochemical racial index (*i.e.*, according to the terminology of the HIRSCHFELDS, the proportion of the groups II and IV, both containing A, to the groups III and IV, both containing B) of 0·9; among 546 Sumatran natives a b.r.i. of 0·82; among 592 Chinese (from Southern China) of 0·92, and among 79 Tamils (Madrassi) of 0·55. According to this, the index is higher in the Southern Far-East than it is in India. The authors propose to extend their research to other Malayan populations.

N. H. Swellengrebel.

ARMSTRONG (J. S.) & MATHESON (H. Farquhar). **Blood Groups among Samoans.** [Memoranda.]—*Brit. Med. Jl.* 1924. Sept. 27. p. 575.

This brief note records some results of blood-group investigation of 51 presumably pure Samoans and 12 Chinese coolies. Of the Samoan bloods 7·9 per cent. fall in group I, 37·3 per cent. in group II, 13·7 per cent. in group III, and 41·1 per cent. in group IV. Of the Chinese bloods 8·3 per cent. fall in group I, 8·3 per cent. in group II, 41·6 per cent. in group III, and 41·6 per cent. in group IV. Of one other Samoan blood the corpuscles were not agglutinated by any of 16 Samoan and Chinese serums, and the serum agglutinated corpuscles of groups I and III only.

A. A.

COMBY (J.). **La médecine au Maroc.**—*Presse Méd.* 1924. Aug. 20, Sept. 3 & 17. Vol. 32. Nos. 67, 71 & 75. (Supplément.) pp. 1403–1412 & 1418; 1487–1496 & 1502–1503; 1571–1580 & 1586. With 37 figs. [2 refs.]

Those who are interested in the practice of medicine, both curative and preventive, in Morocco will find much of value in this series of papers. Starting with Tangiers, the author visited Tetuan, Ceuta and Larache in the Spanish Zone, Ouezzan, Kenitra, Rabat, Meknes, Fez, Taza, Oudjda and other towns in French Morocco, and finally Oran in Algeria. A series of photographs gives a good idea of the hospitals and schools. In nearly all these places lying-in hospitals aud infant welfare centres (Goutte de lait) have been or will shortly be founded. Neosalvarsan and its variants are widely used and give the doctors great prestige; after an injection, the native returns at once to his vocation, with no apparent harm. The author was struck by the poverty of the Moroccans, great numbers of whom are ill-clothed, ill-housed and ill-fed; beggars abound. Their privations lessen their strength and energy, diminish their capacity for work and make them ready victims to malaria, typhoid, smallpox, dysentery, tuberculosis, and acute affections of the respiratory organs. The example of the French has already resulted in improving their methods of agriculture, and thus it is hoped to better their economic position.

A. G. B.

BIJLMER (H. J. T.) & DE ROOK (H.). **Medisch verslag van den bergtocht en slotbeschouwingen.** [Medical Report of the Mountain Expedition and Final Remarks.]—[From the Medical Reports of the Scientific Central New Guinea Expedition.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 670–681.

Apart from the malaria and blackwater fever already described, the only illness of any importance, during the expedition, was dysentery. Sporadic cases of amoebic dysentery were met with as well as a few small epidemics of bacillary dysentery; emetine and serum injections proved to be very useful.

W. J. Bais.

SWEET (W. C.). **Notes on the Differential White Blood Cell Percentages of Residents of Brisbane, Queensland.**—*Med. Jl. Australia.* 1924. July 5. 11th Year. Vol. 2. No. 1. pp. 1–5. [6 refs.]

The details of this paper are not of much general interest. The percentages appear to have been calculated on 200 cells per slide, and 914 counts embracing numerous categories—healthy and otherwise—and all ages are included. The final conclusion is that the following percentages, according to J. D. THOMSON'S classification (Vol. 21, p. 112), would represent the "so-called" normal for Brisbane residents:—Polymorpho-neutrophile 45 to 60, polymorph-eosinophile 4 to 13, polymorpho-basophile 0·2 to 0·5, lymphocytes 28 to 35, endothelial leucocytes 5 to 8.

A. A.

DOLBEY (Robert V.) & MOORO (A. W.). **Some Notes upon Blood Transfusion in Egypt.**—*Lancet.* 1924. Sept. 13. pp. 547–548. [6 refs.]

Dolbey and Mooro have carried out 42 transfusions during the last four years, not only for haemorrhage and shock and in surgical circumstances where shock is anticipated, but also in the treatment of anaemias and deficiency diseases. As regards its employment for the latter purposes they make some general remarks confirmative of its value in stimulating blood-forming tissues rendered torpid by the effects of hookworm and schistosome infections. In their practice, though they verify the value of blood-grouping both in transfusion and in tissue-grafting, they do not find any essential incongruity in the bloods of the various races and racial blends—Egyptian, negro, negro-arab, and levantine—represented in Egypt. They think that, as an exigency, transfusion with unclassed blood is justifiable, but the effect of a small initial dose should be watched. Possibly the dangers of incompatible blood have been exaggerated, they think, and incongruous blood though not of value as an oxygen-carrier, may have other vitalizing uses.

A. A.

FRONVILLE (G.). **Les maladies de l'appareil uro-génital chez la femme noire et leurs rapports avec sa fécondité.**—*Bull. Méd. du Katanga.* 1924. Aug. Vol. 1. No. 4. pp. 147–148.

At Elizabethville in 1921 the author made a gynaecological examination of the women of the troops and police. Of 293 he found 174, or

59 per cent., to have some affection of the genito-urinary parts—salpingo-ovaritis or abnormal ovaries 69, uterine deviations 56, gonorrhoea 21, metritis 14. Of 135 other women examined 40 were healthy and had one child a piece surviving ; 83 suffered from uro-genital affections and had 0·3 child surviving or one to 3 women. The fecundity was shown to vary with the character of the union : there was one child to two legal marriages, and one to five cohabitations (100 unions investigated).

A. G. B.

VAN LOON (F. H. Gl.). **Eene nieuwe methode van lumbaalpunctie met stuwing om den hals.** [A New Method of Lumbar Puncture with Pressure round the Neck.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 868–900. With 2 text figs. [27 refs.]

In a series of 37 lumbar punctures the author found the average pressure in normal position (stretched vertebral column) to be 16·8 cm. water ; by flexion of the neck the pressure rose to an average of 31·4 cm., by constriction of the neck to 37 cm. and by combined flexion and constriction to 58·1 cm. The amount of liquor which could be withdrawn was considerably larger when this technic was used. Yet the well known disagreeable after-effects of the puncture were far less pronounced in the author's cases than usually. The constriction of the veins prevents even a momentary lowering of the intracranial pressure, which in van Loon's opinion is the cause of such trouble. He recommends this method as well for diagnostical as for therapeutical purposes. In the treatment of meningitis the withdrawal of a large quantity of liquor causes a lavage of the spinal canal ; drugs or sera may be mixed with larger quantities of liquor previously withdrawn and subsequently injected up to a higher level than is usually possible.

W. J. Bais.

GOELAM. **Bepaling van het ureumgehalte van het bloed bij Europeanen en Inlanders in de tropen door middel van soja-urease.** [Determination of Blood Urea in Europeans and Natives in the Tropics by means of Soja Urease.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 844–867. With 1 text fig. [16 refs.]

In 25 natives the average urea content was found to 24·4 mgm. per 100 cc. blood, in 10 Europeans the average was 32·3 mgm. Goelam thinks that the higher protein content of the dietary of the European accounts for this difference, and that the difference in the residual nitrogen content of the blood in both races may certainly be explained by the urea difference.

For details concerning methods and apparatus used by the author, the original paper should be consulted.

W. J. Bais.

DALE (H. H.). **An Address on Progress and Prospects in Chemotherapy, delivered in the Section of Physiology of the British Association at Toronto.**—*Brit. Med. Jl.* 1924. Aug. 9. pp. 219–223.

We can note some commanding points in the line of flight, if we cannot abstract the spirit, of this instructive address on the progress and prospects of chemotherapy.

We are reminded that the object of chemotherapy is to discover remedies that will arrest infectious diseases not by abating their symptoms but by impeaching their specific parasites. A crude idea of such a remedy might be supplied by quinine and ipecacuanha as used respectively in the treatment of malarial fevers and amoebic dysentery. The real complexity of the idea is unravelled in this address.

The study of chemotherapy did not, however, emerge from experience of these traditional specific remedies; it emanated from the study of immunity and from EHRLICH's grand conception of synthetic chemical products which, like antibodies, should close with and disarm specific parasites while leaving the tissues of the host untouched—a conception supported by the actual existence of certain synthetic dyes having selective affinities for particular elements of tissues and cells.

The search for chemical substances analogous to antibodies started at one point therefore from synthetic dyes, and their action on trypanosomes of standardized virulence; thus in the course of time were produced the trypan red of EHRLICH and SHIGA and the trypan blue and the afridol of MESNIL and NICOLLE, the last of which led the advance to the more persistently powerful non-arsenical trypanocides—salts of a complex sulphonic acid, not dyes—of recent days.

Regarding the action of these substances, taken generally, certain arresting phenomena were soon observed. Although they may destroy trypanosomes in the living body they do not kill them *in vitro*—though they may so affect them *in vitro* that when afterwards they are injected into a susceptible host they fail to establish themselves there; again, they may kill a given infection in a host of one species and not in a host of another species. Obviously there is something here more subtle than a direct selective affinity between a given chemical and a particular trypanosome protoplasm; there must be some co-operation, immediate or delayed, on the part of the host.

Another starting-point in the search for synthetic chemicals that should strike the parasite without harming the host was furnished by the action of arsenic. Thus were produced atoxyl and salvarsan. These, again (in any *in vivo* comparable dosage) are not mortal to trypanosomes and spirochaetes *in vitro*, though the arsenoxides resulting from their partial oxidation are. This was supposed to explain their lethal action within the living body as being due to a reducing process effected by the co-operation of the host's tissues—the reducing action, in the case of salvarsan, continuing slowly and safely for a long term because of the insolubility of that drug. However this may be, it does not explain the trypanocidal action of tryparsamide—the most powerful of all these arsenic derivatives—which is now attributed to its easy penetration into the tissues of the host and its strengthening of their natural resistance.

The action [see this *Bulletin*, Vol. 21, p. 672] of LEVADITI'S "bismoxyl"— a product, directly lethal to trypanosomes and spirochaetes, resulting from the incubation of certain bismuth salts with fragments or extracts of fresh animal tissue—has also been explained, by some, as due to a "reducing" process brought about by the tissue; but since the hypothetical "bismoxyl" can be produced if bismuthous oxide, or even metallic bismuth, be used in the incubation process, a likelier explanation is that some constituent of the tissue is an essential participant in the trypanocidal action of the bismuth derivative. Then the fact that strains of trypanosomes acquiring resistance to a trypanocide (atoxyl) in one species of host (mouse) and retaining it through indefinitely long series of that species, lose it when they are transferred to another species of host (rat) is inexplicable on any theory of direct action on the trypanosomes and loss of "chemoreceptors," but is well consistent with LEVADITI'S theory of active participation, or co-operation of the tissues.

These conceptions of a remedy destroying parasites not directly but by weakening their resistance to the natural defences of the host; or acting not in itself but in virtue of products formed either directly from itself within the host or in union with some constituent of the host's tissues; or having an affinity for particular cells or tissues of the host where it can be fixed, or can accumulate to be afterwards slowly and safely released—these conceptions, which are supported by various observations of the higher homologues of quinine and the dyes of the acridine series in the treatment of bacterial infections, must potently influence the search for more effective specific remedies.

The author quotes some of his own and DOBELL'S observations of the effect of alkaloids of ipecacuanha on the dysentery amoeba and in the treatment of amoebic dysentery as an illustration of the elusive and even illusive nature of the search for such remedies. For instance, methyl-psychotrine and certain artificial derivatives of emetine being (unlike emetine) directly lethal to the amoeba *in vitro* and (also unlike emetine) practically devoid of toxicity for man, should by the primrose path of immediate inference be placed far above emetine for the treatment of amoebic dysentery; yet when given to patients they had "no effect whatever" in cases of that disease that were promptly cured by subsequent administration of emetine. Another puzzling observation was that of an amoebic infection which in man yielded readily to treatment with emetine, but upon which, when transferred to the cat, emetine had no influence at all.

A. A.

BARNETT (J. W.). **Notes on the Local Concentration of Drugs.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 447–450.

Except in the spleen and liver, where the blood comes in direct contact with the tissue, exchange between the outer medium and the tissues is carried on through the lymph. A drug, therefore, as administered by intravenous injection, is diluted by the lymph as well as by the blood before it reaches a particular diseased area, and there are numerous drugs that cannot—consistently with the safety of the patient—be administered in such concentration as to remain effective under this excessive dilution. By an adaptation of Bier's congestion treatment, however, this physiological dilution of potent drugs may be so limited in a (conveniently situated) diseased area as to permit an effective concentration there without risk to the patient, the drug being injected into a local artery and the local circulation at once arrested. Colloid preparations and antisera can be injected as they are, but in other cases the drug is to be dissolved in 10 cc. of a stock solution of 0·5 per cent. citrate of soda and 0·5 per cent. novocaine (if pain is anticipated) in distilled water, together with a few drops of sodium carbonate solution if the drug be acid.

The author has applied this argument to the treatment of Madura foot in patients who decline amputation, and he gives here some notes of six cases in which, respectively, copper sulphate (⅛ to ½ gr.), colloid antimony (½ to 3 cc.), and simple sodium chloride solution, were injected into the posterior tibial artery and a tourniquet immediately applied to the leg above the wound of operation and retained there for half-an-hour or an hour. In one of these cases, where a succession of injections, of 15, 20, 30, 15, 15, and 15 gr. of sodium chloride was given over a term of six weeks, " a definite cure could be claimed, so far as the Madura disease was concerned." In two cases, where colloid antimony was used, the drug appeared to be retained in the blood vessels rather than diffused in the diseased tissues. In one case, where copper sulphate was used (and the foot ultimately amputated) all the tissues had become pervaded by copper. The author believes that this local congestion treatment would be specially suitable for tubercular disease of limb-bones and joints, for acute septic conditions of the extremities, and for meningeal disease—where mild congestion might be produced by a soft muffler round the neck. For the details of the author's methods of operation the original paper must be consulted.

A. A.

CAMERON (John). **The Chemical Purity of Carbon Tetrachloride.**—*China Med. Jl.* 1924. Aug. Vol. 38. No. 8. pp. 633–637. [6 refs.]

The author has carefully analysed samples of carbon tetrachloride supplied by leading pharmaceutical houses in different parts of the world, and has detected carbon disulphide in all but one of them ; in one instance the proportion of carbon disulphide was approximately, and in another was actually, 1 per cent. The dictum of the B. P. Codex of 1923 is that " carbon tetrachloride for medicinal use should not contain more than 0·1 per cent of carbon disulphide." The author therefore describes here, some simple tests, qualitative and quantitative, for detection of CS_2, and also a method, which he states to be within the competence of an average Chinese dispenser, for the medicinal purification of carbon tetrachloride.

[In the *Pharmaceutical Journal* of 26th July, 1924, p. 102, the following new test is described, which is capable of eliciting a distinct reaction with as little as 5 parts of carbon disulphide per million parts of carbon tetrachloride.

An alkaline plumbite solution is made by dissolving 0·5 gm. of lead acetate in 20 cc. of water and adding 20 gm. of pure caustic potash. To 10 cc. of the carbon tetrachloride is added 3 cc. of this solution and 1 cc. of absolute alcohol. The mixture is boiled and agitated for a few minutes, and allowed to stand. A colouration, brown to bluish-black according to the amount of carbon disulphide present, is developed in a few minutes in the aqueous layer, a darkening being appreciable with as little as 5 parts per million. This test, it is suggested, may be utilized for colorimetric determination of small amounts of CS_2.

The opinion is expressed, incidentally, in this paper that the limit of 0·1 per cent. CS_2 permissible by the B. P. Codex is too high for carbon tetrachloride supplied for medicinal purposes].

A. A.

DAVIS (Nelson C.). **The Influence of Diet upon the Liver Injury produced by Carbon Tetrachloride.**—*Jl. Med. Res.* 1924. Sept. Vol. 44. No. 5. (Whole No. 194.) pp. 601–614. With 2 plates. [3 refs.]

Experiments are here tabulated showing the observed effects of carbon tetrachloride, chiefly upon the liver, of dogs under varied conditions of diet, and they show that factors of diet influence very greatly the toxicity of that drug. "Mixed diets and high protein diets—which may be considered normal for dogs—are more or less protective. High carbohydrate diets afford very striking protection against liver injury. Starvation is harmful. 'All fat' diets preceding carbon tetrachloride administration are conducive to a maximal injury of liver parenchyma."

In the experiments 19 dogs were used, and more than one experiment was performed on each, a piece of liver being excised (with described precautions against haemorrhage), and not less than a month being allowed to elapse between successive operations. The set conditions of diet were continued for 4 days before administration of tetrachloride; the dosage ranged from 0·2 to 1·0 cc., and the administration was always followed by a purge, since (although purgation diminishes the toxicity of the drug) purgation is usually employed in treatment campaigns. The operation, or necropsy, was done on the 2nd (rarely the 3rd) day after the administration of the tetrachloride.

For purposes of comparison the author gives a general description of the pathological changes (in liver, kidney, etc.) that may follow the administration of carbon tetrachloride.

A. A.

SCHULTZ (Edwin W.) & MARX (Alberta). **Studies on the Toxicity of Carbon Tetrachloride.**—*Amer. Jl. Trop. Med.* 1924. Sept. Vol. 4. No. 5. pp. 469–485. With 2 plates. [19 refs.]

Similar studies made since 1921, when carbon tetrachloride was brought into use as an anthelmintic by HALL, are discussed. In all these cases the drug was administered to animals by mouth or by stomach tube. In this series the experiments were more strictly controlled than hitherto. Dogs were used. They were anaesthetized with ether and a wedge removed from the liver. The drug was injected by syringe into the duodenum. 55 animals received doses ranging from 0·05 to 5 cc. per kilo body weight. Three dogs had the operation without the injection. Moreover, for the kidney observations five animals had one kidney removed before the drug was administered and the other examined at the autopsy.

Central necrosis of liver was always observed when the dose exceeded 1 cc. per kilo, and in 10 out of 12 cases after 1 cc.; fatty degeneration affected the livers of 8 out of 9 animals which received 0·1 cc. and some animals which received 0·05 cc. showed both these changes. It is concluded that if these observations hold for man the usual dose of 3 cc. for an adult cannot with safety be exceeded. Experiments in which magnesium sulphate was given as well as carbon tetrachloride showed that some protection is thereby given, and it has already been shown that the efficacy of the anthelmintic is not impaired [Vol. 21, p. 583].

The authors' carefully controlled observations showed that definite fatty changes are not produced in the kidneys by carbon tetrachloride.

A. G. B.

YOUNG (A. G.) & MUEHLBERGER (C. W.). **Excretion of Tryparsamide.**—*Jl. Pharm. & Experim. Therap.* 1924. June. Vol. 23. No. 5. pp. 461–464. With 1 chart. [5 refs.]

Several cases of impairment of vision have followed treatment by tryparsamide. The authors thought that variations in susceptibility to this drug might be an expression of different rates of excretion. Four normal men, whose bladders had just been emptied, received 2 grams each intravenously, and the urine was collected for 24 hours and arsenic determined. With one exception (G.K.) 88–95 per cent. was excreted within that period, and a further test confirmed the rule and the exception. It would appear that with G.K. there should be a longer interval between doses than in the other subjects. The authors conclude :—

"Certain individuals show a much slower rate of excretion. These individuals retain the arsenic over a much longer period of time and, therefore, may be more susceptible to cumulative effects of the drug. In such cases it might be advisable to increase the interval between the repeated medication beyond the usual weekly period." A. G. B.

i. COUVY (L.). **Le stovarsol dans l'angine de Vincent.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. p. 530.

ii. ——. **Le stovarsol dans l'ulcère phagédénique.**—*Ibid.* pp. 531–532.

iii. ——. **Un cas de bronchite fétide traitée par le stovarsol.** —*Ibid.* pp. 533–534.

In these papers the author describes the good effect of stovarsol in three types of disease attributed to the association of fusiform bacilli and spirochaetes.

i. Vincent's angina and ulcero-membranous stomatitis are common at Antananarivo. About 15 cases have been treated with stovarsol: a 0·25 gm. tablet is broken up with a little water or glycerine and the paste applied to the carefully cleansed lesion 3 or 4 times daily. Concurrently the mouth is washed with a 0·25 per cent. solution of stovarsol, or with peroxide of hydrogen, one in three. Improvement is manifest in 12 hours and after 24 the lesions are clean and fusiform bacilli and spirochaetes are hard to find. Treatment has never been necessary for more than three days.

ii. The cleansed phagedaeic ulcer is packed with powdered stovarsol, a dry dressing is applied and the ulcer dressed again after 24 hours, when improvement is generally obvious. In 2 or 3 days suppuration has ceased. Change of dressing at 3 or 4 days' interval is then sufficient. Details are given of three cases in which cicatrization was complete in 6 to 15 days, and of one in which a commencing ulcer was cured with one application. Application of stovarsol is not painful. Ulcers of other origin were thus treated without success.

iii. The result of treatment of a case of fetid bronchitis with 0·5 gm. doses daily, was disappearance of smell, lessening of expectoration, general improvement and almost complete disappearance of fusiform bacilli and spirochaetes. The patient was a Hova, aged 40, whose sputa totalled over 400 cc. daily. Treatment lasted 6 days, was interrupted for 4 and resumed for 6 more, when the patient considered himself cured.

DOPTER asked for further information on the use of stovarsol in amoebiasis, especially whether this drug really prevents the formation of cysts. A. G. B.

CODET (H.). **La médecine française à Constantinople.**—*Progrès Méd.* 1924. June 28. No. 26. p. 406.

This is an appreciative recognition, which will be generally endorsed, of the successful missionary labours of Frenchmen in the fields of exotic medicine, and particularly of the educational work accomplished, in spite of discouragement, by the zealous DELAMARE, at the Haidar Pasha School of Medicine near Constantinople. This work has already been noticed here (Vol. 21, p. 839).

A. A.

STONES (R. Y.). **A Case of Quinine Amaurosis.**—*Kenya Med. Jl.* 1924. Sept. Vol. 1. No. 6. pp. 182–183.

The patient, aged 40, in this case had the sight of his right eye profoundly obscured from childhood by an accident. Also, he had a history of suspected syphilis and a positive blood reaction, and he smoked 15 to 20 cigarettes a day. In the twenty-one days before being seen he had had fever, for which he had received quinine—15 grains in tabloids daily for 15 days, plus 2 intramuscular injections of 6 grains each afterwards, and an unknown amount in powder and mixture. When seen (by the author) he was quite blind in both eyes; quinine was stopped and he was put on strychnine combined with vasodilators. Next day he thought he could see a white coat, and 12 days afterwards he could count fingers with the left eye and walked with confidence.

A. A.

KNOWLES (R.) & DAS GUPTA (B. M.). **On the Nature of** *Blastocystis hominis.*—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No 1. pp. 31–38. With 4 plates. [9 refs.]

Merely in the course of 1849 successive routine stool-examinations not aiming at plenipotence the authors have encountered Blastocystis in 28·8 per cent. of them, more frequently in the hot than in the cold season; and during last year they cultivated (Barret's technique) the forms of the organism that occur in faex of guineapig, rat, rhesus monkey, and man, all of which seem to be very much alike. Their observations and conclusions agree generally with those of LYNCH (see this *Bulletin*, Vol. 19, p. 824, and Vol. 20, p. 454) and ARAGÃO (this *Bulletin*, Vol. 21, p. 140). They observed multiplication by fission (binary and plural), by exogenous budding, and by endogenous spore-formation inside an ascus (best seen in cultures more than 48 hours old), and they regard Blastocystis as a genus of higher fungi closely allied to the Schizosaccharomycetes and as of quite unproved pathogenetic significance. A large number of the varied and deceptive forms assumed by the organism are figured; some of them have suggested to the authors the possible existence of gametocytes and tiny gametes.

A. A.

ELWES (F. F.). **The History of Medicine.**—*Trans. S. Indian Branch Brit. Med. Assoc.* Madras. 1924. Vol. 17. No. 2. pp. 73–84.

This elegant outline of the history of ancient medicine does not profess to be more than a compilation from easily accessible sources. The lecturer insists on the simple truth that rational medicine [like so many other things that give us moderns ever present help] is founded on the treasure and informed by the spirit bequeathed to us from Ancient Greece.

A. A.

REVIEWS AND NOTICES.

The Genera *Councilmania, Karyamoeba* and *Caudamoeba.**

In an earlier note (this *Bulletin,* Vol. 19, p. 19) the reviewer expressed it as his opinion that the amoeba named *Councilmania lafleuri* by KOFOID and SWEZY (1921) was *Entamoeba coli,* and that the so-called budding process on which the genus *Councilmania* was founded was merely the result of rupture of the cyst of *E. coli* through the openings in which hernia-like buds of cytoplasm were expressed. GUNN (1922), who examined some of the cases in which KOFOID and SWEZY had found *Councilmania lafleuri,* came to the conclusion that *E. coli* alone was present and that the name *C. lafleuri* was a synonym of *E. coli.* In those cases in which *C. lafleuri* was described as ingesting red blood corpuscles he concluded, as the reviewer had done, that a mixed infection of *E. coli* and *E. histolytica* had been present.

KOFOID, SWEZY and KESSEL (1924) and KOFOID and SWEZY (1924) return to the subject of *C. lafleuri,* and replying to the reviewer's criticisms and those of GUNN, reaffirm their belief in its individuality, while KESSEL (1923), KOFOID, SWEZY and KESSEL (1923) and KESSEL (1924) claim that *Entamoeba muris* of mice and *E. decumani* of rats also belong to the same genus, as they have been found to exhibit a similar budding process. KESSEL (1923) furthermore claims that rats and mice can be infected with *C. lafleuri* as well as *E. coli, E. histolytica, Endolimax nana* and *Iodamoeba bütschlii* and that in these rodents the various amoebae, particularly *C. lafleuri* and *Entamoeba coli,* retain their morphological characteristics. It is stated that *Councilmania muris* of mice as well as *C. lafleuri* of man can establish themselves in rats, so that if these statements are correct it has to be recognised that rats may harbour three distinct species of *Councilmania* as well as *Entamoeba ratti,* a new form said to resemble *E. coli,* with which these rodents may also be naturally infected. Observers may be pardoned for hesitating to accept these statements as final in view of the great difficulty associated with the differentiation of intestinal amoebae, which in the case of the human host has required years of laborious work by many competent investigators before anything like a clear understanding could be reached.

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*REFERENCES (arranged chronologically).

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SWEZY (Olive). Mitosis in the Encysted Stages of *Endamoeba coli* (Loesch). -*Ibid.* 1922. May. Vol. 20. No. 13. pp. 313 332. With 3 plates. [16 refs.]

GUNN (Herbert). Councilmania Lafleuri not a New Amoeba. —*Jl. Parasit.* 1922. Sept. Vol. 9. No. 1. pp. 24–27. [2 refs.]

BERCOVITZ (Nathaniel). A Comparison of the Cysts of *Endamoeba coli* and *Councilmania lafleuri* in Congo Red.—*Univ. California Public. Zool.* 1923. Feb. Vol. 20. No. 15. pp. 365-371. [2 refs.]

KESSEL (John F.). Methods of Obtaining Amoeba-free Rats for Experimental Infection with Intestinal Amoebae.—*Ibid.* 1923. Oct. Vol. 20. No. 18. pp. 401-408. [9 refs.]

——. Experimental Infection of Rats and Mice with the Common Intestinal Amoebae of Man.—*Ibid.* 1923. Oct. Vol. 20. No. 19. pp. 409–430. With 2 plates. [21 refs.]

KOFOID (Charles A.), SWEZY (Olive) & KESSEL (John F.). On the Genus *Councilmania* Budding Intestinal Amoebae Parasitic in Man and Rodents.—*Ibid.* 1923. Oct. Vol. 20. No. 20. pp. 431–445. With 19 figs. [11 refs.]

KESSEL (John F.). Experimental Infection of Culture Rats and Mice with the Common Intestinal Amoebae of Man.—*Proc. Soc Experim. Biol. & Med* 1923. Nov. Vol. 21. No. 2. pp. 110–111.

The authors named above write of the genus *Councilmania* with much assurance, and by extending it to include the parasitic amoebae of rats and mice they assume that the genus is finally established though, as will be shown below, there are very strong reasons for rejecting it.

Kessel and Svensson (1924), in their survey of the human intestinal Protozoa in Pekin include *C. lafleuri* as a distinct species, though they admit that it is necessary to stain films with iron-haematoxylin as it is "impossible to make accurate differentiation between *Endamoeba coli* and *Councilmania lafleuri* when examined only in iodine-eosin stain."

The genus *Councilmania* is based entirely on the occurrence of the budding process, which Kofoid, Swezy and Kessel (1924) claim to be a definite biological phenomenon. The structure called the chromophile ridge, which is supposed to have some mysterious connexion with the formation of the pore in the cyst wall and the production of the buds, is not present in all cysts of *C. lafleuri*, while it occurs rarely, according to Kessel, in cysts of *C. decumani*, so that, whatever its real nature, it cannot be regarded as affording a feature of generic value. Kofoid, Swezy and Kessel assert that appearances of budding cannot be produced by artificial rupture of the cyst, as claimed by the reviewer. Since writing his original criticism the reviewer has obtained further evidence that artificial rupture can give rise to these appearances. It would be expected that larger cysts, especially if the cyst wall was of a soft consistency, would be more liable to rupture, and it is significant that Bercovitz (1923) has shown that the cysts of *C. lafleuri* are as a rule larger than those of *E. coli*, while their shape, which is in many cases ovoidal or elipsoidal, suggests that they are more readily deformed than the spherical ones of *E. coli*. Furthermore, Bercovitz's observation that the cyst wall in *C. lafleuri* stains with Congo red while that of *E. coli* does not, again may be taken to indicate a difference in consistency. That the consistency of the cyst wall of all the intestinal amoebae varies considerably is the experience of every one who has had to do with the staining of cysts, which in some cases are permeable to stains and in other cases quite impermeable. Though the reviewer can see no reason for changing his opinion that the budding process can be produced in this way, its existence, even if not artificial, cannot be advanced as a distinguishing generic character. The authors admit that the method of escape of *E. coli* from its cyst is not known, though it must be perfectly evident to them that

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References—*continued.*

Kofoid (Charles A.), Swezy (Olive) & Kessel (John F.). On the Distinctions between *Endamoeba coli* and *Councilmania lafleuri*.—*Univ. California Public. Zool.* 1924. January. Vol. 26. No. 3. pp. 21 39. With 24 figs. [6 refs.]

Kessel (John F.). The Distinguishing Characteristics of the Parasitic Amoebae of Culture Rats and Mice.—*Ibid.* 1924. Feb. Vol. 20. No. 23. pp. 489-544. With 6 plates and 3 figs. [39 refs.]

Kofoid (Charles A.). & Swezy (Olive). A Note on Dr. Gunn's Difficulties with Councilmania.—*Jl. Parasit.* 1924. Mar. Vol. 10. No. 3. pp. 153–157. [7 refs.]

—— & ——. The Cytology of *Endamoeba gingivalis* (Gros) Brumpt Compared with that of *E. dysenteriae*, with Special Reference to the Determination of the Amoebas in Bone Marrow in *Arthritis deformans* of Ely's Second Type.—*Univ. California Public. Zool.* 1924. June. Vol. 26. No. 9. pp. 165–198. With 5 plates and 1 fig. [40 refs.]

—— & ——. *Karyamoeba falcata*, a New Amoeba from the Human Intestinal Tract.—*Ibid.* 1924. June. Vol. 26. No. 11. pp. 221–242. With 2 plates and 2 figs. [12 refs.]

Kessel (John F.) & Svensson (Ruth). A Survey of Human Intestinal Protozoa in Peking, China.—*China Med. Jl.* 1924. Dec. Vol. 38. No. 12. pp. 961–981. [19 refs.]

Faust (Ernest Carroll). A New Type of Amoeba Parasitic in Man Observed in North China.—*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 221–226. With 2 plates. [5 refs.]

E. coli does emerge from its cyst when infection of a new host takes place. When the emergence is seen it will certainly be found to be associated with a pore or rupture in the cyst wall through which the entire cytoplasm of the amoeba or portions of it will escape. As the authors have not seen *E. coli* escape from its cyst they have no means of comparing the process in the two genera *Councilmania* and *Entamoeba*, so that the budding process cannot afford a means of distinguishing these genera. There would be more justification for placing *Entamoeba gingivalis* in a distinct genus because its cysts have never been seen. Kofoid and Swezy (1924) in their description of *E. gingivalis* do not adopt this course, though they are very emphatic as to their own failure and that of others to discover encysted forms. Recently a new light has been thrown on the behaviour of cysts by Sellards and Theiler (1924). They have shown that kittens can be infected with *E. histolytica* by injecting per rectum material containing cysts alone, so that there is a possibility that this amoeba may escape from its cyst in the large intestine without the necessity of leaving the host in which encystment occurred. If *E. histolytica* can do this it is equally possible for *E. coli*. The reviewer has recently examined stained preparations containing cysts of *E. histolytica* in which certain cysts revealed the budding process supposed to be characteristic of the genus *Councilmania*. It may be that this appearance in some cases at least represents the natural method of escape of *E. coli* and *E. histolytica* from their cysts.

As regards the chromophile ridge, the reviewer stated that it had probably resulted from a rupture of the cyst causing folds or creases in the cyst wall. In other cases it was suggested that it might represent chromatoid bodies. He is still convinced that in many cases this is a correct explanation, though in the later papers the authors describe as chromophile ridges a greater variety of different objects. In some cysts deeply staining bands are named chromatoidal bodies, while obviously identical structures in other cysts are called chromophile ridges. In the case of *C. decumani*, in the cysts of which chromophile ridges are said to occur rarely, the faintest streaks of stain are called chromophile ridges and homologized with deeply stained bands in other cysts. Radiating streaks of deeply staining cytoplasm converging on the pore are also included, as well as evidently damaged chromatoidal bodies. There appears to be no limit to the speculations regarding these structures, as evidenced by the descriptions accompanying some of the figures. Such remarks as "chromatoidal body exhausted in the formation of the chromophile ridge" and "fasciculate chromatoidal body, from one end of which a chromophile area passes out into the densely chromophile cytoplasm in the pore to the chromophile bud," are really without meaning and merely add to the confusion. All these appearances are readily accounted for by regarding them as irregularities in staining due to damage of the various constituents of the cyst—cytoplasm, chromatoid body and cyst wall.

For the reasons stated above, and many others into which it is not possible to enter here, the reviewer is convinced that the various amoebae placed in the genus *Councilmania* belong to the genus *Entamoeba*, for in his opinion the authors have brought forward no single feature which justifies the revolutionary step they have taken.

Not being content with introducing what appears to be an unnecessary genus *Councilmania*, Kofoid and Swezy (1924) go further, and attempt to found yet another genus *Karyamoeba*, for an amoeba of the human intestine. In this case the basis of the new genus is the nucleus, which has upon its membrane one or more crescentic masses of a deeply staining substance. During nuclear division these masses form two separate clumps which occupy the poles of the elongating nuclear membrane as deeply staining pole-caps, while at the equator of the spindle, within the nuclear membrane, about 20 chromosomes appear. The karyosome takes no part in the formation of the pole-caps and at nuclear division it is said to pass to one of the daughter nuclei. The authors make the extraordinary mistake of comparing this type of nuclear division with that of amoebae of the genus *Vahlkampfia*, to which they suppose their new amoeba is allied. The characteristic feature of the division of the nucleus of a member of the genus *Vahlkampfia* is the formation of pole-caps from the karyosome, which divides into two parts which pass to the ends of the elongating nucleus. In the case of *Karyamoeba* the pole-caps are formed from the masses on the nuclear membrane, so that the supposition made by the authors that the nuclear division in *Karyamoeba* is of the *Vahlkampfia* type is entirely erroneous. It is well known that the nuclei of *E. histolytica* and *E. coli* sometimes possess large masses of deeply staining material on the nuclear membrane in place of the more uniformly distributed granules. Such masses are commonly seen in the nuclei of encysted forms of *E. histolytica*, and when such nuclei divide the substance, whatever its real nature, forms caps at the poles of the elongating nucleus just as they are described as doing in *Karyamoeba*. Quite recently the writer has seen amoebae similar to *K. falcata* in sections of a human liver abscess. In the division of the normal nuclei of *Entamoeba* the granules on the nuclear membrane are scattered and pass to the daughter nuclei as separate granules, and do not form compact pole-caps. When the granules happen to be aggregated into masses, then pole-caps appear, so that the pole-caps in the dividing nuclei of *Karyamoeba* lose the important significance which KOFOID and SWEZY attach to them. Their presence cannot be regarded as affording a basis for a new genus. The other characters of *Karyamoeba falcata*, including the chromosome number of 20, even if correct, cannot be regarded as of more than specific value.

When it comes to a consideration of the specific characters by which the various species of *Councilmania* are distinguished from one another and from members of the genus *Entamoeba*, an array of dogmatic assertions regarding the constancy of minute characters is encountered. It is assumed that the three species of *Councilmania* always produce clear pseudopodia and have a dispersed type of karyosome, that *Entamoeba coli* always produces granular pseudopodia and has a compact karyosome and that *E. histolytica* has clear pseudopodia and has a compact karyosome. The type of movement and shape of the pseudopodia of these amoebae are compared. There appear to be various degrees of motility. *E. coli* is sluggish, *E. histolytica* is very active, while *C. lafleuri* occupies an intermediate position. The pseudopodia are described in detail. The rate of their production, the number formed at one time, the relation of their width to their length, and other details, are given with an assurance which would lead an inexperienced observer to believe that species might be distinguished by them alone. All these descriptions are based on observations made on the amoebae after they have left the body and are in an unnatural environment. The authors admit that the specimens were obtained by the administration of saline purges, the effect of which on the amoebae even when in the intestine cannot possibly be gauged. It is the reviewer's opinion that any single species may show all the variations which are supposed to characterize these several species. The only definite morphological character which can be fixed upon is the chromosome number In the case of the three species of *Councilmania* (*C. lafleuri*, *C. muris* and *C. decumani*) it is said to be 8, 6 and 4 respectively, a morphological provision for which the most optimistic could not have hoped. The number in *E. coli* and *E. histolytica* is 6, while in *Karyamoeba falcata* it is about 20. Definite assertions such as these imply that there are available very accurate methods of counting the chromosomes. It is remarkable that in a paper specially devoted to mitosis in *Entamoeba coli* SWEZY (1922) could go no further than to state that the chromosome number was *probably* 6. In the case of nuclei of the type under discussion the estimation of the exact chromosome number is beset with many difficulties. There are numerous granules in the nuclei and these stain with varying degrees of intensity, so that in dividing nuclei it is purely a matter of opinion whether any one granule is regarded as a chromosome or not. If the chromosome numbers as given by these authors are correct, then their claims regarding the distinction of species are established, but the reviewer finds it difficult to believe that the authors have succeeded in counting the chromosomes in so many forms with that degree of accuracy which is demanded if the chromosome number is to be employed for differentiating species. The fallacies associated with investigations of this kind are so numerous that he is unable to accept as final the definite statements made. In view of the fact that other competent observers have failed to distinguish the chromosomes, he prefers to adhere to his opinion that *C. lafleuri* is *E. coli*. For similar reasons he believes that *C. muris* is *E. muris* and that *C. decumani*, if not *E. muris* in the rat, is a distinct species *E. decumani*. The amoeba called *E. ratti* by KESSEL, which bears the same relation to *C. decumani* in the rat as *E. coli* does to *C. lafleuri* in man, he believes is *E. muris* or *E. decumani*. As regards *Karyamoeba falcata*, it is probably an abnormal form of *E. histolytica*, as all the three individuals harbouring it are admitted to have had an *E. histolytica* infection also. In the particular stool in which the movements of *K. falcata* were studied it is stated that other amoebae occurred. There were motionless precystic forms and cysts of *C. lafleuri*, motile forms of a small race of *E. histolytica* and active forms of *E. coli*, but no cysts or precystic forms of this amoeba. It would seem highly probable that the active forms of *E. coli* belonged to the precystic forms and cysts of *C. lafleuri* and the large *Karyamoeba falcata* to the small, probably precystic, forms of *E. histolytica*. A diagnosis of a mixed infection of typical and atypical *E. coli* and *E. histolytica* would, in the reviewer's opinion, cover all the amoebae present.

Quite apart from the question of the species of *Councilmania*, the transmission experiments described by KESSEL (1924) are worthy of attention. In the first place it is stated that the presence or absence of natural amoebic infections in rats and mice can be accurately gauged if the faeces of the animals are examined on two successive days following the administration of a purge in the shape of bread soaked in magnesium sulphate solution. Animals have been examined in this way and the results have been controlled by direct examination of the intestine post mortem. In this manner it is said that amoeba-free animals can be isolated for subsequent feeding experiments. Animals which were thus shown to be free from infection were fed with material containing cysts of all the human intestinal amoebae, with the result that when they were examined several weeks later after the administration of a purge, a certain number were found to be infected. The author claims that his experiments prove that *C. lafleuri, E. coli, E. histolytica, E. nana* and *I. bütschlii* can all be transferred to these animals. He gives a series of figures of the encysted forms obtained from the faeces, and these leave no room for doubt that they are actually the cysts of the amoebae in question. The interval elapsing—two weeks or more—between the time of feeding with cysts and their recovery in the faeces of the animals would seem to preclude any possibility of the cysts having remained unpassed for this length of time. The reviewer, however, feels that the statement that rats and mice can be proved to be free from amoebic infections as a result of only two examinations of the faeces requires to be very carefully controlled by other observers before it can be finally accepted. In the case of human beings, it is well known that such a test cannot possibly afford accurate information regarding the presence or absence of infection. If rats had a latent infection of *E. muris* and were then fed with cysts of *E. coli* or the supposed *C. lafleuri*, confusion would inevitably result. Natural infections of rats with amoebae of the *E. histolytica* type have also been noted, so that another fallacy is introduced. In the case of *Endolimax nana* and *Iodamoeba bütschlii* no similar amoebae of rats and mice are known. KESSEL claims that all these fallacies have been eliminated in his experiments, but the questionable methods adopted by him for distinguishing species of intestinal amoebae, and his recognition of the genus *Councilmania*, so influence his experiments that his claims as to the possibility of infecting rats and mice with all the human intestinal amoebae require the most careful confirmation before they can be accepted with confidence.

In this place mention may be made of another generic name which is not a product of the Californian School of Protozoology. FAUST (1923) gave the name *Caudamoeba sinensis* to an amoeba which he found in the human intestine in N. China. In this case the generic character is a structure called the caudostyle, which appears at the posterior end of some of the amoebae, which assume a slug-like form associated with progression in one direction. The elongate amoebae have a rounded anterior and a more tapering posterior end, where there is developed a small pointed spine, to which the name caudostyle is given. Bacteria and other débris tend to adhere to the body in the region of the caudostyle. The assumption of this particular body form is not, however, peculiar to *C. sinensis*. It occurs quite commonly in free living amoebae when they move in this manner, and it has been noted in several parasitic forms, amongst which is the common amoeba of the cockroach. Undoubted *E. histolytica*, particularly in artificial culture, not infrequently assume the elongate body form for progression in one direction. Bacteria and other débris in these cases adhere to the posterior end of the body, as in *Caudamoeba sinensis*. It does not seem probable that the caudostyle is anything more than a spike of tough ectoplasm which has formed as a result of the continued progression in one direction. It seems to the reviewer that the evidence available is insufficient to justify the separation of *Caudamoeba sinensis* from *Entamoeba histolytica*.

C. M. Wenyon.

MENSE (Carl). **Handbuch der Tropenkrankheiten. 3te Auflage. Band 3. Malaria und Schwarzwasserfieber** (von Prof. Dr. Hans ZIEMANN).—pp. xiv+592. With 7 plates & 152 text figs. 1924. Leipzig: Verlag von Johann Ambrosius Barth. [Price G.M. 36 (unbound), 40 (bound).]

Malaria, pp. 1–480.

When a consideration of malaria covers over 480 large pages, with many hundreds of references, with six admirable coloured plates, and 139 figures, such consideration will cover most of the ground. The print used varies with the estimated importance of the subject, and with this one has little right to disagree. It is manifestly impo ible adequately to deal here with such a volume, the more so that the fi ngs, opinions and conclusions of others than the author have deliberately such a large part in it. The work will be widely read.

Its very composite character leads, however, to difficulties. There are,
for instance (p. 132), a number of charts illustrating tl nonthly incidence
of new cases and of relapses of malaria in Italy, and
(p. 137) dealing with Ziemann's own work in the Cam
one gathers, are based on clinical diagnosis; the
certainties. Firstly, the line purporting to trace new
the total, and which of the others represents new
relapses it is impossible to say. It appears, moreover
characterizes as a relapse any case showing gametoc
blood. Now Warrington YORKE and MACFIE (thi
a paper which Ziemann mentions three times, tw
of primary mosquito infections in general paralytic
to appear in the peripheral blood were almost inv
but in all cases gametocytes made their appearance
later." This single observation renders meaningless
the book.

Again, the work of CHRISTOPHERS, SCHUEFFNER, MAXCY, DARLING, and others already requires the rewriting of the chapter on the spleen index, in which matter the work in India scarcely receives the mention which is its due; and recent deliberate infections of general paralytics with malaria have thrown into relief, and necessitate fuller consideration of, natural immunity in, and natural cure of, malaria.

It is concluded that available evidence suggests an indirect effect of quinine on malaria parasites. Yet it is again stated most emphatically, with no evidence or references cited, first, that quinine acts best on the free merozoits or small schizonts, and, second, that the quinine content is highest in the blood two or three hours after ingestion. It is accordingly concluded that the drug should be given at that interval before the expected rigor. But if quinine act indirectly, as for instance through metabolites, the amount of quinine momentarily circulating can have no necessary relationship to its momentary curative power; possibly the reverse.

Consideration of the vexed question of intramuscular injection of quinine leaves dissatisfaction, since there is no adequate reference to the mass of evidence that, on occasions at least, the amount of quinine imprisoned and useless in the muscles may be great, and must render that route one of grave uncertainty in any particular instance. Quinine resistance, again, is accepted as a fact, without note of the growing evidence that it should be termed non-absorption, wilful or otherwise.

The references, although so numerous, may be aggravatingly wanting, as, for example, in the nomenclature of the parasites. Another instance of their inaccuracy, which a very casual search reveals, is the discovery that Deli, which calls up Sumatra, should read Delhi, which gives one a mental shift of many hundreds of miles.

Clayton Lane.

Blackwater Fever, pp. 481-592.

After perusal of this handsome volume the reviewer is filled with amazement when he reflects that it is only about six years since the appearance of the equally handsome second edition. That the demand, in the present hard times, for expensive books of this kind is sufficiently great to warrant the production of a new edition so shortly after the previous one is striking testimony to the general interest in tropical medicine. Certainly the necessity for the new edition cannot have arisen from any rapid growth of knowledge concerning the etiology, pathology or mechanism of blackwater fever, as anyone who takes the trouble to glance through the summaries of papers relating to this disease can readily convince himself.

No less than 112 pages are devoted to blackwater fever and consequently it is not surprising to find that the subject is treated very fully. Of its kind the volume impresses one most favourably, it is beautifully printed and contains a vast mass of information. Possibly from the point of view of the ordinary student or practitioner, it contains too much, although, as the author states in his preface, matter of a purely scientific or casuistical nature is printed in small type. On the other hand, however, the book will doubtless prove of value to those specially interested in blackwater fever in so far as it gives a general idea of the scope and nature of the observations recorded by the numerous investigators who have devoted themselves to a study of this perplexing disease. Criticism is unnecessary, but it might perhaps be noted that the graphs depicted in Figs. 141 and 142, each of which occupies almost an extra page, are after STEPHENS—a fact which is omitted both in this and in the previous edition. The book is a good one of its kind, and the question whether, in the absence of any appreciable advance in knowledge, the frequent appearance of new editions is justifiable, is obviously one which concerns the publishers.

Warrington Yorke.

BELL (Walter George) [F.S.A., F.R.A.S.]. **The Great Plague in London in 1665.**—pp. xii+374. With 30 Illustrations comprising Contemporary Prints, Plans and Drawings. 1924. London: John Lane. The Bodley Head Ltd. New York: Dodd, Mead & Co. [Price 25s. net.].

Those of us who are not professors of epidemiology have probably taken our impressions of the Great Plague of London from the pages of DEFOE's famous *Journal*. We know quite well that that immortal work is not formal history; but we know that its author must have heard a great deal about the calamity when men remembered it and would have been ready to talk about it, and might even, as a small boy, have himself been affected by it; and we know also that he was a man of extraordinary gifts of comprehension and discernment, and an honest godfearing man who three times suffered in the pillory rather than bring trouble upon his printers; moreover, we know that "history" is a term by no means "purged and snuffed from ambiguity." So that what DEFOE worked out by the light of nature and in the fear of God many good men have been content these two hundred years to take for true.

The present work, composed in the light of recent knowledge of plague causation and by modern methods of research, is something very different from the old-fashioned tale of DEFOE. Based on contemporary documents, and effectively illustrated by portraits and reproductions of other contemporary pictorial matter, it is a full and authoritative account of particular events of the great epidemic as it took its course and of a diversity of individual characters, great and small, as they played their part upon its tragic stage. It is thus furnished with an official precision and a wealth of historic personal interest that is lacking in its great original; but, above all this, it places the Great Plague of London in its proper sanitary perspective, and thus may still afford a salutary lesson to a generation rather apt in its superior wisdom to forget the past.

To the world of DEFOE hygiene was unknown; an epidemic was a fierce, inscrutable disaster presaged by signs and wonders in the heavens, and plague a mysterious malady that might perchance be averted by an amulet. To DEFOE himself the Great Plague was indeed a judgment, but acting by means of an infection brought from Holland; that any determinative causation existed in the then normal environment of the people of London was in those days a conception outside the bounds of possible knowledge. It is a leading feature of the present book that it explains to the general reader how in 1665 all the causes of a plague epidemic were in rampant existence in London itself. The author depicts the horrible insanitary condition of the London of that time—the awful slums, and the wooden houses surrounded by every sort of accumulated dirt and defilement attractive to rats (native rats of the *rattus* or "black" species)—and then by an appeal to history he shows that mortality from plague, notwithstanding every inducement to conceal it, had been a regular item of the city's records from the beginning of the 17th century—a legacy from the Middle Ages. Even "in 1499 a severe plague in London caused Henry VII. to retire to Calais," and in 1563 thousands died of the infection. There was an epidemic in 1593, one much greater in 1603, one much greater still (41,313 deaths) in 1625. In short, the city records, as we are here told, were clear of mortality from plague in only four doubtful years between 1603 and 1665. Moreover, in spite of the Great Fire of 1666, which is popularly supposed to have utterly consumed the infection, plague still held its footing in London until 1679. Thus the reader is led to understand the Great Plague of London not as a sudden infection from abroad suddenly ended by a cleansing conflagration, but as the worst-known epidemic exacerbation of a long-persistent endemic disease; and is led to appraise the Great Fire of London as not so much a direct and complete specific disinfection as a sweeping clearance of an insanitary site and focus, for subsequent sanitary reconstruction and security. And this is an encouraging lesson for the practical sanitarian, since it illustrates—as does also the history of malaria in England—how, even in entire ignorance of its recondite scientific causation, a specific endemic disease can be extinguished by a straightforward sanitary advance on broad lines.

Among other particulars of medical interest the author tells us, mainly on the authority of Dr. Hodges, that very disastrous consequences resulted from a widespread belief that venereal disease was protective against plague—a particular iniquity not mentioned by Defoe. On the other hand, Defoe states that a prodigious number of rats and mice was deliberately destroyed by poison (a statement that in those days could never have occurred to the most finished exponent of artistic verisimilitude in fiction), whereas the present author, although he quotes an absentee official as instructing his clerk to " take all course you can agaynst ratts," says that no attention appears to have been paid to rats, unless they were included with the dogs and cats and " other vermin " officially ordered to be killed.

It is a pity that the author insists so much that Defoe's honest story should suffer comparison with his own opulent monograph. Outside the eternal realms of poetry and philosophy and things of the spirit, there are for written books no standards of comparison common to the 18th and 20th centuries, even if standards of historic verity had scientific precision. Judged by the standard here set, Defoe must be allowed to have given an accurate account of the Great Plague considered merely as an isolated epidemic phenomenon, and a truthful representation of its multiplied sorrows of hell and of its divers other concurrent and consequent events and reactive effects—although (unlike most of us) he appears to have had some unduly favourable misconceptions of the literal efficacy of official orders. So that those who delight in him for his manner—his honest piety and grave simplicity, his homely speech, his philosophic tolerance for the weakness of affrighted human nature, his tedious brief excursions with the three men of Wapping and the poor waterman of Blackwall—may still trust him " in the general " for his matter, and therefore will not suffer him to be dealt with as an imaginative writer of historic fiction.

A. Alcock.

War Office. **Memoranda on Medical Diseases in Tropical and Subtropical Areas.** (Revised with additions by Bt. Lt.-Col. W. P. MacArthur, R.A.M.C.) 4th Edition. 1924. 275 pp. With 131 figs. 1924. London: H.M. Stationery Office. [Price 2s. 6d. net. Postage extra.]*

For concentrated worth, as well as for artistic and technical proportion and for modesty of price, this little book is a wonder. In 275 small pages of good paper and clear type it supplies an excellent account—clear, concise, critical, and well supplemented by charts and figures—of the several diseases of lower latitudes, arranged in alphabetical order, each disease being harmoniously treated in all its major aspects; it includes also, under the heading of Arthropod Pests, a succinct and well-illustrated treatise on the ancillary subject of medical entomology; and all for half-a-crown. With all its concentration it has none of the vile crudity of a cram-book: the account of each disease represents the well-digested product of a balanced diet rich in vitamins. Though it could undoubtedly be used as a text-book, it is essentially a book for the practitioner and the medical officer, as is finely and diversely exemplified in the chapter on the differential diagnosis of fevers, in the admirable chapters on malaria and amoebic dysentery, and in the paragraphs on vaccination and vaccine lymph in the tropics. There are, it would seem, certain omissions which, since one is loath to assume that they are unwitting, cause surprise when the varied complexion of the civil and military services of the Empire is considered. The most obvious of these omissions are, in alphabetical order, epidemic dropsy, hill-diarrhoea, leprosy, sprue, yaws, and yellow fever.

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* Purchasable direct from H.M. Stationery Office, Adastral House, Kingsway, London W.C. 2; 28, Abingdon St., London, S.W. 1; York St., Manchester; 1, St. Andrew's Crescent, Cardiff; or 120, George St, Edinburgh; or through any Bookseller.

It is a cheering confirmation of the old adage that "good wine needs no bush" to find that this good book has reached a fourth (revised) edition in the course of six years without the meed of any melodious advertisement This present revision brings it quite up to date besides imparting a few touches of academic polish.

A. Alcock.

MALARIA (CORRESPONDENCE).

DARLING (Samuel T.). **The Spleen Index in Malaria.** *Southern Med Jl.* 1924. Aug. Vol. 17. No. 8. pp. 590-595. Discussion pp. 595-596.

Dr. Darling writes from Leesburg, Georgia, (February 12, 1925) as follows :—

"I should like to correct certain errors which have been made in a recent issue of the *Bulletin*, Vol. 22, No. 1, p. 41.

"On page 41 the reviewer has attributed to Dr. BARBER authorship of the article on 'The Spleen Index in Malaria' published in the *Southern Medical Journal*, August 1924. This is an error. The article is a paper written by me and read before the National Malaria Committee, which met conjointly with the Southern Medical Association, November 12-15, 1923, and my name appears under the title of the article.

"Because of the opinion expressed in the article that methods of detecting the degrees of splenic enlargement finer than those used in the Orient would probably have to be used in the Southern States, the reviewer declares that CHRISTOPHERS' work reviewed in this *Bulletin*, August 1924, Vol. 21, No. 8, had evidently not reached America, but he has failed to note on page 590 of the *Southern Medical Journal* that my paper was read November 1923, manifestly at too early a date for me to have seen CHRISTOPHERS' papers published in April the following year. CHRISTOPHERS has given us a method for measuring the enlarged spleens so often encountered in the Orient. Here in the Southern States where there is less under-feeding and less hyperendemicity, spleens of the largest sizes are very rarely encountered. Because of these facts I suggested on page 592 of the article that spleens of the smaller sizes, particularly those palpable on deep inspiration, would also have to be detected and recorded, if the spleen is to be used here to measure malaria. These small spleens are pathological and they are evidences of malaria. This is my point, as may be gathered from the text on page 592 and from the classification of the sizes of spleens used in measuring malaria at the Leesburg Station. It is quite different from anything which appears in CHRISTOPHERS' articles, but it is a point which the reviewer seems to have overlooked."

We are glad to publish Dr. Darling's letter and regret the errors to which he draws attention.—Ed.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 5.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

JAMES (W. M.) & DEEKS (W. E.). **The Etiology, Symptomatology and Treatment of Intestinal Amebiasis.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 271–308. [United Fruit Company, Boston, Mass.] Also *Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 97–136.

In this paper the authors have condensed the results of more than sixteen years of continuous work on intestinal amoebiasis. They consider that this disease is extremely varied in its symptomatology. It may remain latent, without symptoms, and acute, subacute and chronic dysentery are not its most frequent manifestations.

Though *Entamoeba histolytica* is the most important etiological factor, it is often aided by stasis which engenders a temporary or chronic inflammation of the mucosa of the large intestine. The normal habitat of the parasite is the lumen of the large intestine, and it becomes pathogenic only when it invades the tissues ; this invasion may be local or general, and the clinical symptoms will vary accordingly. Reinfection of the bowel wall from the lumen is a very important factor. Treatment, to be successful, should aim at destruction of the parasites in the lumen, as well as those in the bowel wall. The authors' own experience has been that acute and chronic dysenteries were much more frequent 15 years ago than to-day, and they believe that the use of emetine and its modifications has altered very considerably the clinical aspect of amoebic infection. The amount of gastro-intestinal disturbance without the appearance of diarrhoea and dysenteric symptoms, which was due to amoebic infection and was then unrecognized, cannot be stated with certainty. Since they have become familiar with the small precystic and cyst-forming generations of *E. histolytica* they have never failed, with one exception, to find them in the stools of liver abscess cases. The authors believe that amoebic infection in man is for the most part conveyed by the swallowing of particles of fairly fresh faecal material, which, though outwardly dry, contain the cysts in thick moist centres. We know that ascaris infection is conveyed in a similar manner. Dysentery, in epidemic form, follows contamination of the water supplies, and is due to a bacillary infection, but when such epidemics do take place in a country where intestinal amoebiasis is endemic, mixed infections occur in a considerable percentage of cases. The pernicious habit of using human faeces as a garden fertilizer is undoubtedly responsible for much endemic infection. This, too, undoubtedly aids in the transmission of infected material.

In countries where amoebic infection is widespread, subacute and chronic appendicitis occurs frequently. Sometimes infiltration of the submucosa of the appendix by entamoebae with or without adhesions has been reported. There is one symptom which is invariably present in amoebic dysentery which, it is claimed, is of considerable diagnostic and prognostic importance, and that is the doughy, inelastic skin. This inelasticity they have termed *myxenoid*, and it is found in very ulcerated or chronic inflammatory conditions of the abdominal viscera. Latent infections are found most frequently in children. James has seen cases of anaemia and emaciation when heavy infections of *E. histolytica* were found. Digestive disturbances are frequently produced, it may be the appendix, or amoebic infiltration of the caecum, or any part of the colon, with resulting reflex as well as local disturbance. Palpation of the colon may elicit definite points of tenderness, while radiographs will not infrequently show a filling defect in the wall of the colon, corresponding to the tender point. Colicky pains may occur with or without constipation, but oftenest in cases with alternating constipation and diarrhoea. These colics, which may be severe, are likely to be confused with appendicitis, cholelithiasis, renal colic and diverticulitis. The milder types of colitis simulate very closely the condition known as mucous colitis, but, unlike the latter, yield rapidly to treatment. Repeated and severe haemorrhages may result from a very small lesion and give rise to the suspicion of malignant disease. Palpable masses in the abdomen resembling tumours may be noted.

Treatment, to be successful, should attack the entamoebae in the lumen of the bowel as well as in the tissues. Emetine acts chiefly upon the tissue parasites. The authors strongly advocate bismuth subnitrate, which has been in use for over thirty years; the combined emetine and bismuth treatment is still being used in Panama with the result that none of the cases treated have become chronic and, as far as can be ascertained, 75 are still residing at Panama or in the Canal Zone. During the period 1914–1923, 95 cases were admitted to the hospitals with liver abscess, and 17 of them died (18 per cent.). During Deeks' experience in the Canal Zone they were able to follow 66 treated cases over a period of several months, and found that relapses occurred in 4½ per cent. James has shown that bismuth salts have an indirect influence on the entamoebae, which early show degenerative changes. The authors believe that certain products of putrefaction are essential to the life of the organisms, and that bismuth acts either by destroying the putrefactive bacteria, or in neutralizing some product essential to the existence of the entamoebae. Bismuth subnitrate is given in heroic doses, 180 grains mechanically suspended in a tumbler-full of milk or water every 3 hours, night and day in severe cases. Occasional untoward effects noted—cyanosis and forcible heart's action—are due to the use of impure bismuth. Out of 100 cases of liver abscess admitted to Ancon hospital in only 2 had the bismuth treatment been previously administered. Judging from clinical experience cases of dysentery are cured in this manner with but few relapses.

Other methods of treatment, such as powdered Brazilian ipecacuanha root, Chapparo amargosa and salvarsan preparations, have been tried, but are not recommended. Together with the bismuth treatment, which may be continued for at least 6 weeks, a non-irritating diet must be persisted in for 2 or 3 months. During the first 10 days of treatment a very strict diet must be adopted. Emetine itself is a powerful cardiac depressant, and at times is a nerve poison ; localized, as well as multiple neuritis, resembling beriberi in its manifestations, may result. Stomatitis may occur. Emetine should never be used if surgical intervention is contemplated.

P. H. Manson-Bahr.

GARIN (Ch.) & LÉPINE (Pierre). **Étude de 208 cas d'amibiase recueillis dans la région lyonnaise ; thérapeutique arsenicale.**—*Presse Méd.* 1924. Nov. 22. Vol. 32. No. 94. pp. 927–929.

The authors consider that amoebiasis was introduced into France by Colonial troops during the war. In order to ascertain whether the infection was spreading, or the reverse, an investigation was undertaken in the vicinity of Lyons. 208 cases have been observed in less than four years, 191 of which were in men, 16 only in women, and one in a child. The series was classified into two main groups : those of exotic origin and those due to indigenous infection. The great majority belonged to the former group, the infection having been contracted in Macedonia, Indo-China, Morocco, Egypt, West Africa, etc. Forty indigenous cases are cited, 35 in men and 5 in women ; of these 21 had been in contact with Colonial troops during the war and in 11 the source of infection could not be determined. To summarize, 81 per cent. were infected abroad, 19 per cent. on French soil. Close contact with infected human beings was responsible for 72·5 per cent. of the cases. In about 10 per cent. of instances women appear to have contracted the infection from their husbands. From the prophylactic point of view this experience points to the dangers arising from repatriation of men who have lived for any length of time in the tropics, and suggests an increased vigilance at the frontiers to prevent the importation of amoebiasis. [How this is to be effected is not quite clear.]

Amongst the complications of amoebiasis which have been noted are six cases of liver abscess (2 autochthonous), a subperiosteal abscess of amoebic origin associated with a fatal hepatic abscess, one of bronchopneumonia, oedema of the lung also associated with the same condition, and anaemia, which may be of a grave character. The solar plexus and the suprarenal glands appear to be often affected. Amoebiasis is frequently associated with pulmonary tuberculosis, and in this series especially with malaria—in 128 instances. Treatment by stovarsol—75 cgm. daily for 10 days—is outlined ; antirelapse treatment on these lines should consist of 25 cgm. of this drug every two days. Acetylarsan, a little known drug, has given very satisfactory results. It is administered either by subcutaneous or intramuscular injection, 75 cgm. once a week for four injections. This treatment can be combined with emetine, of which three injections are given weekly. After a month of such treatment the cysts disappear from the stools.

P. H. M-B.

SCOTT (George H.). **Amoebic Dysentery in the Army.**—*Milit. Surgeon.* 1924. Dec. Vol. 55. No. 6. pp. 722–736. [13 refs.]

The admission rate for dysentery for natives in the U.S. Army is considerably higher than for American troops; this applies to all forms. It is probable that many native soldiers are infected prior to enlistment. The death rate for amoebic dysentery for the past four years is extremely low, due to effective treatment, especially emetine. No deaths were registered from this cause in American or native troops in 1920, 1921 or 1922.

P. H. M-B.

VON KROGH (Mentz). **Kronisk aǒmbedysenteri.** [Chronic Amoebic Dysentery.]—*Norsk Mag. f. Laegevidenskaben.* Oslo. 1925. Feb. Vol. 86. No. 2. p. 128.

In Argentina about three-fourths of the population have, at some period of their lives, been attacked by amoebic dysentery in an acute or chronic form. Usually the parasite cannot be demonstrated. It would be a great mistake in these cases to make the diagnosis dependent on the finding of the amoeba. Emetine is the sovereign remedy for the chronic, just as for the acute form.

E. E. Atkin.

MONTEL (G. H. M.) & MONTEL (M. L. R.). **Un nouveau cas d'adénopathie iliaque d'origine probablement amibienne.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 629–630. [1 ref.]

In a recent communication (see this *Bulletin*, Vol. 21, p. 470) one of the authors described ten cases of enlargement of the iliac lymphatic glands in Annamites, said to be due to acute or chronic amoebiasis. A similar occurrence in a European is here reported. Unfortunately his faeces were not examined. The patient was suffering from diarrhoea and colic, and a palpable mass was discovered in the right iliac fossa; subsequently, on radiographic examination, a shadow was seen in the same situation. On emetine treatment the glandular mass subsided, and the patient recovered.

[The inference that this adenopathy was of amoebic origin is very weak, especially when a strong positive Wassermann reaction, which is recorded, would suggest an entirely different explanation.]

P. H. M-B.

HEIMBURGER (L. F.). **Amebiasis Cutis. With a Survey of the Medical Literature to Date.**—*Arch. Dermat. & Syph.* 1925. Jan. Vol. 11. No. 1. pp. 49–55. With 2 figs. [9 refs.]

A case of amoebic infection of the skin is here described. The patient, a Chinese farmer, had suffered from a tumour in the loin which, on rupturing, discharged liver pus. From that time an ulcer had developed in the right lumbar region in the mid axillary line, measuring 12 by 6 cm. and 4 cm. in depth; the edges were indurated, everted and raised above the surrounding skin, with a border of hyperpigmentaion. The odour of the exuding pus was foul. A sinus was discovered which opened on the floor of the ulcer and communicated with a cavity in the liver. The pus from this sinus contained numerous amoebae. Under emetine treatment the amoebae disappeared from the pus, so that at the sixth injection of 2 gr. daily no more could be found. In stained sections of tissue excised from the floor of the ulcer and one removed from its edge amoebae were found. Not only were they present in the pus from the surface, but also in capillaries and lymph spaces of the subcutaneous and granulation tissue. In one individual an ingested red blood corpuscle could be distinguished. Dr. COUNCILMAN, to whom these sections were shown, verified the correctness of the diagnosis. The foregoing findings together with the history of chronic dysentery and intense hepatic pain led to a diagnosis of amoebic infection of the skin subsequent to the discharge of liver abscess pus. Under emetine injections (18 gr.) the pyrexia remitted and the ulcer rapidly healed. The ulcer was dressed with pulverized ipecacuanha. The patient left hospital eleven weeks after admission in good health. At no time could amoebae be demonstrated in the faeces. Heimburger thinks that the present is the second authentic case of amoebic infection of the skin. The only previous minute description of the organisms in the skin is the one by ENGMAN and HEITHAUS [this *Bulletin*, Vol. 17, p. 13].

The author draws attention to the fact that amoebic infection of the skin does occur and that care should be taken to prevent it after operative treatment for amoebic abscess of the liver.

P. H. M-B.

DE MELLO (Froilano). **Note sur les amèbes rencontrées dans les ulcères fuso-spirillaires d'Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 75–81. With 1 plate. [2 refs.]

After reading DOBELL's criticisms of " amoebae " found in cutaneous lesions, the author happened to examine some pus from an ulcer in a European, in which he saw some undoubted amoebae exhibiting feeble movements in a hanging-drop preparation. Some of the material was stained by Leishman and numerous spirochaetes and fusiform bodies demonstrated. In some films fixed wet in Bouin and stained with haematoxylin structures are encountered which are figured in the plate and are [according to the author] undoubtedly *E. histolytica.* Some of the cells which he has figured are regarded as cysts. The author concludes that in Angola certain intestinal amoebae, " it may be *E. histolytica* or *E. coli,*" can invade the skin and are probably inoculated into sores by flies. These amoebae are probably symbiotic with the spirochaetes.

[The author has been unable to assign several of the structures figured in his plate to any known species of amoeba parasitic in man. The figures certainly depict some curious cells upon the nature of which it is difficult to enlighten him.]

P. H. M-B.

SHARP (Clive J. H.) & MORRISON (Henry). **Entamoebae as an Etiological Factor in Multiple Abscesses.**—*Brit. Med. Jl.* 1925. Jan. 31. pp. 205–206. [4 refs.]

Multiple abscesses are of frequent occurrence in Nigeria ; they are of two main clinical types affecting the muscles of the limbs and the ilio-psoas muscle. Some of them are believed to be due to entamoebae.

In confirmation of this view a case is cited of an African servant who suffered from deep abscesses in the arms, thigh and left buttock. Entamoebae were found in the pus and healing rapidly took place after injection of emetine. The organisms exhibited active movements. The serious condition of the patient, the physical peculiarities and sterility of the pus point to the amoebae as being the cause of the condition.

P. H. M-B.

ALLEN (G. V.). **Notes on a Case of Infection of the Ileum with** *Entamoeba histolytica.*—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 238–239. With 1 plate.

Infection of the small intestine with *Entamoeba histolytica* is rare. So far only two instances are on record, one published by HARRIS in 1898, the other by KUENEN in 1909. The patient was an adult male Masai, a prisoner, who had suffered from diarrhoea and dysentery, but not of a severe type. Death took place suddenly. At autopsy ulceration of the lower twenty-four inches of the ileum was noted. The ulcers, for the most part, were superficial ; only one, 1 by 0·5 cm., was large ; the remainder were very minute. The large intestine was intensely ulcerated ; some of the smaller lesions were typical in shape. Microscopical sections of the ileum showed individual entamoebae in spaces in the submucosa and mucosa and in one section between the fibres of the circular muscle. In sections of ulcers in the large intestine the amoebae were found to be numerous in spaces between the fibres of the circular muscle. A microphotograph of the section of the ileum shows *E. histolytica* in position.

P. H. M-B.

THURSTON (E. Owen). **Liver Abscess. A Series of Sixty-Four Cases.**—*Lancet.* 1924. Nov. 15. pp. 1008–1010. [4 refs.]

Thurston affirms that the aspiration treatment of liver abscess has been the operation of choice in Bengal during the last 10 years. In this series, 63 were males, one a female ; 52 were Hindus, 11 Mohammedans, and 1 an Englishman. A history of dysentery was present in 44 cases, absent in 22 ; 35 patients were teetotallers. Their ages varied from 14-70, the average being from 30-40. Out of the total 64 cases, 49 were treated by aspiration alone, and of these 40 were cured and 9 died. The total death-rate for all methods amounts to 14 per cent. Taking the cases treated by aspiration alone, 28 were aspirated once with 4 deaths ; 12 were aspirated twice with 3 deaths ; 7 three times with 1 death, and one four times with a fatal result, and one five times with recovery. The largest amount of pus removed at any one aspiration was 96 ozs., the smallest 4 ozs. ; with multiple aspiration the largest amount was 220 ozs. There were 35 lateral operations, 25 epigastric, and four in abnormal positions. Epigastric operations included both right and left lobe abscesses. In two cases there were multiple abscesses combined with extensive ulceration of the bowel.

Three unusual cases are recorded : in one the abscess pointed over the crest of the ilium, having tracked down from the extra-peritoneal surface of the liver ; in another instance the abscess pointed in the right loin ; the third patient expectorated liver pus on admission. Adequate treatment with emetine is as important as the operation. In uncomplicated cases the stay in hospital is a week or ten days.

An ordinary Potain's aspirator is used, general or local anaesthesia being employed. The site of the puncture is important, and should always be towards the *upper* surface of the abscess, particularly in epigastric cases. An abscess extending to the level of the umbilicus should be aspirated from above downwards from just below the costal margin, because, as the pus is being evacuated, the liver retracts with great rapidity. Two bottles should always be ready; when one is full it is replaced by the other, so that aspiration is continuous. The subcutaneous injection of emetine (grs. 2) should be effected directly aspiration is complete. With the emptying of the abscess cavity a negative pressure is set up and later an effusion of serum takes place into it; the object is to charge this serum with emetine to kill off the amoebae in the outer wall of the abscess.

Fifteen cases were treated by other methods; cases in which the abscess cavity has become secondarily infected should be drained at once. Nine cases were treated by incision, cleaning out the cavity with gauze, and primary suture; this is a useful procedure where the diagnosis is doubtful or the swelling in an abnormal position. No cases received emetine-bismuth-iodide, gr. v. to x. of emetine being considered ample.

P. H. M-B.

TOWNSEND (R. S.). **Hepatosis (or Tropical Abscess of Liver): an Examination into the Diagnosis and Treatment of this Disease in India, with Especial Reference to the Use of Emetine.**—*Jl. Roy. Army Med. Corps.* 1924. Dec. Vol. 43. No. 6. pp. 401-421.

The old type of liver abscess which is diagnosed from great swelling of the liver or by evacuation through the lung is now seldom seen, especially in the Army, owing to the universal use of emetine in the treatment of inflammatory diseases of the liver. Unfortunately, despite the most effective treatment of dysentery, the mortality rate of liver abscess, as shown in the Army Returns, is still 25 per cent. The age incidence is from 20-40, and the author estimates that it is much rarer in women than in men than the proportion 1 to 20 usually stated. In Army statistics for the last 10 years there are records of this condition in three officers only; the British soldier is more commonly affected. With regard to race the proportion of 1-6 between the Indian Army and the British garrison in India is about correct. The subject of liver abscess in India may be divided as follows over a period of the last 100 years:—

(1) The period before 1870, when ipecacuanha was not in general use and operation was performed only upon obvious swellings.

(2) The period between 1870 and 1900, in which operations were more frequently performed and ipecacuanha was coming into use as the routine treatment for amoebic dysentery.

(3) The period 1900–1919, when ipecacuanha and emetine constituted the recognized form of treatment, and recourse was had to immediate operation on diagnosis.

No part of India seems to be immune from liver abscess, and no station appears to have ever had an epidemic. No place is particularly mentioned in the Army reports, save Secunderabad, from which the largest number reported was five in one year. The author has never seen an amoebic liver abscess secondarily infected. The pus is the result of hepatolysis, not of suppuration. The author regards an increasing leucocytosis in a hepatitis under emetine treatment as a sure sign that hepatolysis is taking place. Signs and symptoms can be classified under three headings : —

Type (1), where there is an obvious liver swelling in right hypochondrium.

Type (2), when the liver is enlarged and shows signs of swelling over the right lobe, indicated by bulging of the intercostal spaces or well-marked signs of pleurisy.

Type (3), acute cases without any marked enlargement of the liver, but with definite signs of inflammation.

The patient who has an abscess in the right lobe of the liver usually takes up a characteristic attitude in bed ; he lies on his back or on the affected side with legs flexed. Shoulder pain is present in about 40 per cent. of cases. X-rays give disappointing results in diagnosis, being only positive generally when other signs and symptoms clearly point to liver abscess. In the *pre-suppurative stage* there is fixation of the diaphragm, with increased respiratory movements. The prognosis of liver abscess pointing into the hypochondrium is very good ; the author has opened 14 cases by this route, and has had 13 recoveries. One case is cited in which an abscess of the left lobe of the liver was diagnosed and pus obtained after nineteen attempts at aspiration. Malignant disease of the liver and tuberculous caries of the spine may be difficult to differentiate from liver abscess.

As regards treatment, emetine should be given in adequate doses, one grain of the hydrochloride every 12 hours. Aspiration should be confined to small abscesses ; cases showing signs of large amounts of pus should be operated upon and drained. Resection of a rib is necessary for free drainage. It is extremely rare to find amoebic abscess and amoebic dysentery in the same person.

P. H. M-B.

CLELAND (J. B.). **Amoebic Dysentery with Abscess of the Liver, Subphrenic Abscess and Purulent Pericarditis.**—*Med. & Scientific Arch. of the Adelaide Hospital. No.* 3. (*Supplement to the Ann. Rep. Adelaide Hospital for the Year 1923.*) pp. 38-39.

The amoebiasis appears to have been contracted in Australia. The patient was sent into hospital with the diagnosis of perforated gastric ulcer and a history of indigestion of five weeks' duration. At autopsy a large amoebic ulcer was found in the caecum, and below the attachment of the pericardium to the diaphragm a large abscess between the left lobe of the liver and the diaphragm communicating with a similar one in the upper portion of that lobe. Although death had occurred 36 hours previously, a motile *Entamoeba histolytica* could still be demonstrated in the wall of the abscess cavity. It appears that infection of the pericardium had taken place from the subphrenic abscess and had given rise to a purulent pericarditis.

P. H. M-B.

PETRIDIS (Pavlos A.). **Le traitement chirurgical de l'abcès tropical du foie.**—*Presse Méd.* 1924. Nov. 12. Vol. 32. No. 91. pp. 895–897. [9 refs.]

The Greek Hospital in Alexandria has treated more cases of liver abscess than any other similar institution in Egypt. The records kept by Aristide PETRIDIS, father of the present author, show over 600 cases of liver abscess treated from 1896 up to 1922, and a greatly decreased number from the year 1914 onwards. The essence of the treatment is early recognition and prompt action. All authorities are agreed that failure to demonstrate pus by exploratory aspiration does not negative the existence of liver abscess. Aspiration, however, is not entirely free from danger as fatal results have been recorded. This consideration led Aristide PETRIDIS to practise polypleurodiaphragmatotomy, a full description of which is here given.

P. H. M-B.

YING (Y. Y.). **A Case of Liver Abscess treated with Carrel-Dakin's Solution.**—*Nat. Med. Jl. China.* 1924. Oct. Vol. 10. No. 5. pp. 327–332.

The patient, a Chinaman, was admitted to hospital with many of the classical signs of liver abscess; there was a considerable degree of anaemia, but no leucocytosis. Aspiration through the seventh intercostal space yielded a litre of thick, malodorous pink-coloured pus. Five days later a further 500 cc. were sucked out. Operation was performed ten days after admission. A large metal cannula with an inside diameter of 1·5 cm. was introduced into the wound without resecting a rib and through this the abscess cavity was irrigated with Carrel-Dakin solution, 10 cc. every two hours. As healing took place the cannula was gradually forced out and finally dropped out on the twenty-third day after the operation. A rubber tube was then inserted and irrigation with the solution continued till forty-three days after the operation.

P. H. M-B.

HODSON (V. S.). **Amoebic Hepatic Abscess treated with Emetine only.**—*Lancet.* 1924. Dec. 20. pp. 1275–1277. With 1 chart. [11 refs.]

This paper is to a great extent a résumé of recorded cases of liver abscess in which a cure was effected, not by operative interference, but by emetine therapy alone. There are many points of analogy between a hepatic abscess and a gumma, but no one would justify operation upon the latter. Two further cases are here recorded (see this *Bulletin*, Vol. 18, p. 38; Vol. 19, p. 330). The first had already suffered and recovered from an amoebic hepatic abscess and was one of those previously recorded. It was presumed that the second abscess had arisen *de novo*. The diagnosis of liver abscess was obvious. After the first injection of gr. 1 of emetine the abscess burst through the lung. The second case had been ill for a long time, was anaemic and obviously very ill. A complete cure took place after 8 grains of emetine.

In conclusion it is urged that, since it has been conclusively proved that even a large amoebic hepatic abscess can be entirely absorbed after emetine treatment, surgical measures of all kinds should no longer be regarded as necessary until emetine has been properly tried. The analogy with gumma and tuberculous abscess is obvious, as when once the cause has been removed the absorption of the more or less fluid contents offers no difficulty.

P. H. M-B.

PAPPALARDO (Concetto). **Sull' uso dei clisteri di emetina nel trattamento dell' epatite amebica colliquativa.**—*Riforma Med.* 1924. Nov. 3. Vol. 40. No. 44. pp. 1036–1039. With 3 text figs.

The case is recorded of a man, 18 years of age, with hepatic abscess, in the pus of which, removed by exploratory puncture, amoebae were found; *Entamoeba histolytica* were also present in the faeces. Rectal injections of emetine (11 were given in 12 days), starting with 3cgm. in 100 cc. of thin agar solution with 20-30 drops of Tr. Opii, and increasing until 10 cgm. were given in a dose, resulted in the disappearance of all pain by the fourth day. 57 cgm. were given in all and no amoebae were seen subsequently, though the faeces were examined repeatedly for the four weeks during which the patient remained in hospital.

H. Harold Scott.

BAX (W. F.). **Die Therapie der Amöbiasis mit Yatren.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28. No. 11. pp. 479–483.

——. **De Therape der Amoebiasis met Yatren.** -*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 13-18.

The results obtained by the use of yatren purissimum, No. 105, have been very satisfactory. Permanent cure in intestinal amoebiasis is a desideratum. Too often it has to be recorded that after an apparent cure a relapse takes place directly the patient returns to the East Indies. In hospital practice exact methods can be instituted for examining different portions of the intestinal contents for cysts by the utilization of a concentration technique. The patient should be put to bed, and while lying on his right side be given a large enema. The faeces are passed in several portions which are then examined and concentrated by Rodenhuis' technique. 1 cc. of faeces are placed in a 100 cc. flask together with 30 cc. of the following:—

Cupric chloride ($CuCl_2\ 2H_2O$) } āā	600 mgm.
Cupric acetate ... ... }	
Formol	30 cc.
Aq. camph.	150 cc.
Aq. dest.	420 cc.
Ac. glacial acet.	4 cc.

Simple agitation is sufficient to emulsify in the case of soft motions. After centrifuging for 3 minutes the sediment is microscopically examined. 25 cases have been treated with yatren and controlled in this manner. The drug is given in 3 gm. doses daily in cachets for 10 consecutive days. The patient should be in bed on a milk diet, and in seven days' time receive a second course. The results are as follows: In 10 cases the author was satisfied that the amoebae were completely eradicated; six cases were controlled for one year; he concludes therefore that 16 were permanently cured. Five cases have been under observation for six months and are apparently cured. Of the remaining five, two have not appreciably improved. These results compare favourably with those obtained with emetine-bismuth-iodide and ipecacuanha. It is therefore certain that in yatren we possess a distinctly active drug for amoebiasis. The drug produces a painless diarrhoea of 3–6 motions a day. Probably it will be better to associate it with emetine.

P. H. M-B.

HUPPENBAUER (Carl). **Ueber einen Fall von 17 Jahre alter aktiver Amöbenruhr und seine Heilung durch Yatren per rectum.** [A Case of Amoebic Dysentery of 17 Years' Duration and its Cure by Yatren given by Rectum.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 51-55.

This is the record of a case of chronic intestinal amoebiasis treated by rectal injections of yatren administered by an apparatus known as the " Enterokleaner," which is described as a subaqual " Darmbad." This original method is particularly suited to the treatment of all chronic infections of the large bowel.

The case described in detail was a patient of 53 years of age who contracted amoebic dysentery in 1906 whilst on service in South West Africa, and had suffered ever since from dysenteric diarrhoea. After the failure of other known remedies, yatren was commenced at first by the mouth, four times daily in 0·25 gm. pills ; for 14 days it was injected into the rectum in doses of 2 gm. daily, and on five occasions it was given as a " Sudabad " (i.e., 2 gm. yatren to 20 litres of solution). The stools became solid on the tenth day of yatren treatment and no more amoebae or cysts were found. The patient's weight rose from 70 to 81·5 kilogrammes within 83 days. The author considers that yatren itself, quite apart from other factors, was responsible in bringing about this remarkable change. The patient returned to active employment, and when last seen in September, 1924, his general health and physical improvement had been well maintained.

[The subaqual " Darmbad," on the model of Brosch-Olpp, is an apparatus with narrow inlet and broad outlet with which it is possible to wash out the bowel with 30 litres of fluid while sitting in a comfortable " Sitzbad."]

P. H. M-B.

FLANDIN (Ch.). **Le dérivé formylé de l'acide méta-amino-para-oxy-phényl-arsenique (tréparsol) dans le traitement de l'amibiase.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 27. Year 40. 3rd Ser. Vol. 48. No. 34. pp. 1628–1636.

In order to reinforce the action of emetine in resistant cases of dysentery RAVAUT advocated the use of arsenobenzene compounds, which given by the mouth are more efficacious than by the intravenous route. Latterly, stovarsol has been found to exert a specific action upon the intestinal lesions. A new compound, meta-amino-para-oxy-phenyl-arsenic acid, known as tréparsol, contains 28·75 per cent. of arsenic, as compared with 27·2 per cent. in stovarsol. Tréparsol is eliminated by the urine and is excreted in a regular manner commencing immediately after administration. It is decomposed in the intestines and then exerts a direct action upon the parasites and a general tonic action upon the body. In acute amoebic dysentery tréparsol alone rapidly causes amelioration of the symptoms and disappearance of the parasites ; combined treatment with emetine injections is, however, more advisable.

During the acute stage tréparsol is given in tablet form in 0·25 gm. doses twice daily, during convalescence in larger doses of four tablets daily or 1 gm. It is claimed that the drug has a specific action upon Lamblia and Trichomonas, as well as upon ascaris and the ankylostomes. The author believes that in tréparsol we possess the most active arsenical compound for the treatment of amoebic dysentery. Seven illustrations are quoted from the author's practice and a number of others from the records of his colleagues.

P. H. M-B.

SULDEY (E. W.). **Dysenterie amibienne spontanée chez le chimpanzé** (*Troglodytes niger*).—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 771–773. [5 refs.]

A captive chimpanzee, aged three years, had suffered from acute dysenteric symptoms for three weeks ; 15-20 blood and mucus stools were passed daily. There was slight fever. Examination of blood-stained mucus revealed active amoebae with ingested red blood corpuscles and the characteristics of *Entamoeba histolytica.* Eggs of *Strongyloides fülleborni* and numerous Blastocysts were present in the same specimen. Probably the chimpanzee is as susceptible to amoebic dysentery as is man, and is infected through the alimentary tract by eating soiled vegetables or fruit.

P. H. M-B.

WAGENER (Edna Hannibal). **A Precipitin Test in Experimental Amoebic Dysentery in Cats.**—*Univ. California Public. Zool.* 1924. Jan. 26. Vol. 26. No. 2. pp. 15–20. With 1 plate. [3 refs.]

The liability of infections with *Entamoeba histolytica* in man to run a chronic course suggests that no complete protective immunity is developed. A search for a specific antigen was undertaken. For this purpose a strain of *E. histolytica*, after passage through 30 cats, was selected. The heart's blood was taken from a cat moribund from amoebic infection and used for serological tests. In preparing the antigen scrapings from the ulcerated surface of the bowel were placed in Coca's extracting fluid (0·5 per cent. NaCl, 0·05 per cent. Na_2CO_3 and 0·4 per cent. phenol). The fluid was then covered with toluol, the scrapings permitted to autolyse for one week, and the whole filtered through hard filter paper. Twenty-seven specimens of cats' blood have now been tested for their antigen content. Seven cats with acute amoebic dysentery gave a strongly positive precipitin reaction in a 1 : 4 dilution with amoebic antigen, those ill for less than 8 days gave a weakly positive reaction with undiluted serum only, while those which died in less than six days gave negative tests. One animal which recovered from the infection also gave a negative test. The results in amoebiasis are therefore analogous to those observed in bacterial infections. Controls with extracts from the colon of a normal cat were negative.

P. H. M-B.

EGUCHI (Churoku). **Ueber die verschiedene Empfänglichkeit junger und erwachsener Individuen für Infektionen. II. Mitteilung. Versuche mit Mäusetyphus und Amöbenruhr.** [The Varying Susceptibility of Young and Adult Individuals to Amoebic Dysentery.]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. Jan. 10. Vol. 104. No. 1–2. pp. 241–249. [6 refs.]

It is a matter of clinical observation that children and adults withstand different infectious diseases in a totally different degree. The author put the matter to the test by feeding mice with the organism of mouse-typhoid (TOPLEY'S strain). All young mice fed with 1-millionth part of a culture died, whereas the adult animals tolerated one hundred times the dose. Guineapigs of 1-3 days old, too, died after feeding with 1-10th and 1-100th part of the culture, whereas the adult could withstand a complete culture with impunity. Young cats can be infected in a high percentage with cysts of *Entamoeba histolytica*; in the experiments 40 per cent. developed dysentery, and one a typical liver abscess; whereas of the older animals, over 500 gm. in weight, only 8·6 per cent. became infected. These observations indicate that the mucous membrane of the young animal is deficient in protective bodies, while the adult animals have developed a high degree of immunity to infection *per vias naturales*.

P. H. M-B.

BACILLARY DYSENTERY.

LEFROU (G.). **Rapport sur une épidémie de dysenterie bacillaire en A.E.F.**—*Revista Méd. de Angola* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a Sessões). 1923. Aug. No. 4. pp. 471–494. With 2 folding maps. [1 ref.]

In the French Middle Congo an epidemic of bacillary dysentery raged during 1922, being especially severe in the district of Mouyonzi-Kimboto. The death rate, though not exactly known, was estimated at 20 per cent. of the total population, the case-mortality in those who were isolated at between 20 and 25 per cent. Further investigations showed that such epidemics are not of infrequent occurrence, for in 1921 the district of Sibiti was decimated by an equally severe one. Its spread amongst the natives is attributed to close contact and to the presence in their midst of carriers of dysentery bacilli. The disease broke out subsequent to the return of a caravan from the Belgian Congo. In the Mouyonzi district from August, 1922, to January, 1923, the total number of deaths attributable to dysentery was returned as 3,126. No evidence was obtained that the spread of the epidemic was attributable to water or to the agency of flies. House infection was a noticeable feature, and is to be expected in view of the primitive habits of the natives. The tribal relationships are also of importance, for the disease appeared to spread with great rapidity when once introduced amongst members of the same tribe. Prophylactic measures are very difficult to enforce among a primitive people on account of their tendency to conceal cases of illness. Special efforts were made to isolate and treat the sick. Antidysenteric serum arrived in March, 1923. For an adult average doses of 40-60 cc. appear to have little effect; in order to obtain any lasting therapeutic action at least 80 cc. must be injected daily, but even 100 cc. or more appear to have little effect upon septicaemic cases. Expense is a great bar to more extensive employment of serum therapy (in the Colony 10 cc. costs 4 francs 50). The total amount of serum given in individual cases was a very large one; in two recorded it was 400 cc. For the relief of pain it was customary to give opium.

Prophylaxis.—3,000 doses of antidysenteric vaccine were issued, and were applied to the most heavily infected region of Sibiti, where 1,937 natives were inoculated. For adults, 1 cc. was given at the first and 2 cc. at the second inoculation. For children, the dose was one-half or one-quarter. No general or local reaction was noted. No results were recorded. The only rational prophylactic and hygienic measure is to transplant the villages a short distance from the highly infected soil on which they stand; fifteen were so treated. Screen-latrines, which were put up by natives in accordance with orders issued, proved complete failures, as they were not used for the purpose for which they had been erected.

P. H. M-B.

DIEHL (Karl) (unter Mitarbeit von Alfred KRAUSE). **Wirbelsäulendeformierung eine Folge von Dysenterie.** [Spinal Curvature a Sequel of Dysentery.]—*Deut. Arch. f. Klin. Med.* 1924. Nov. Vol. 145. No. 5/6. pp. 322–325. [33 refs.]

The patient, who had served as a nursing sister in the war, contracted a Shiga-Kruse dysentery at the end of August, 1917; in November of that year signs of spinal curvature became apparent, and the pain thereby produced became very severe towards the end of the year. In May, 1922, a high degree of kyphoscoliosis was noted; her blood serum agglutinated Shiga's bacillus 1 : 200, and there were signs of a chronic ulcerative colitis.

The author is of the opinion that a chronic osteomyelitis of dysenteric origin was the cause of the spinal curvature.

P. H. M-B.

VAN NITSEN (R.). **Traitement de la dysentérie bacillaire par vaccinothérapie.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. p. 252.

The author considers that vaccine treatment of chronic bacillary dysentery is hardly to be recommended. A vaccine composed of equal quantities of Shiga's bacillus and a Y bacillus, isolated at Katanga, was given during 1921–1922 to a series of 66 cases in doses of 125 millions, then 250 millions, and subsequently in 500 million doses. In a group of 39 treated by vaccine alone the mortality rate was 25 per cent.; in a second series treated by medical measures as well it was 14 per cent.

P. H. M-B.

LÜDKE (Herm.). **Zur Kenntnis des Dysenterietoxins.**—*Deut. Med. Woch.* 1924. Nov. 14. Vol. 50. No. 46. p. 1569. [6 refs.]

The toxaemia of bacillary dysentery is somewhat similar to that of diphtheria and cholera; in the first the disease process is limited to a specialized part of the intestinal canal, whence the toxins are absorbed into the blood-stream; it is, in fact, a *toxicosis*. The bouillon-filtrate of the Shiga-Kruse bacillus is very toxic, so that 0·05–0·1 cc. is fatal to rabbits. The highest percentage of toxin is contained in a broth culture incubated for 2-3 weeks. The author's selected strains of Shiga-Kruse bacilli varied greatly in toxicity, the lethal dose ranging from 0·2 cc. to 6 cc.

P. H. M-B.

LESBRE (Ph.) & VERDEAU (André). **Quelques particularités de l'anatoxine dysentérique.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 165–167. [1 ref.]

A dysenteric toxin was obtained by filtration from a three weeks' culture in Martin's bouillon of a Shiga bacillus whose toxicity had been increased by the collodion-sac method. Upon the addition of 3 per 1,000 formol and incubation for 20 days at 40° C., an *anatoxin* was obtained which was sufficiently attenuated to be tolerated by rabbits in doses of 2 cc. injected subcutaneously as a series of three injections at five days' interval. The ingestion by these animals, however, of 8 cc. on three occasions was followed by great emaciation and temporary paralysis. The anatoxin killed mice when injected in 0·5 cc. doses by the intraperitoneal route. Two rabbits were injected, one with 2 cc of pure toxin, the other with the corresponding anatoxin with the addition of 6 per 1,000 formol; the latter died 36 hours before the former. The addition of 2 per cent. washing soda appears also to increase the toxicity. When the anatoxin is kept with 6 per 1,000 formol for 30 days in the incubator at 40° C. a stable anatoxin is obtained which cannot be further modified by the addition of formol or soda. Rabbits could be rendered immune to virulent cultures of Shiga's bacillus by inoculation of this second anatoxin. In 1/2 cc. intraperitoneal doses it was well borne by mice. It is therefore apparent that a dysenteric anatoxin is capable of protecting not only against the corresponding toxin, but also against living dysentery bacilli.

P. H. M-B.

SCHIFF (F.). **Ueber alkoholische Typhus- und Ruhrdiagnostica.**—*Klin. Woch.* 1925. Feb. 5. Vol. 4. No. 6. p. 285.

Typhoid bacilli contain, according to Schiff, two distinct antigens, one derived from the flagella, the other from the body-substance of the bacteria. The former is very susceptible to various influences; the latter is very stable and retains its antigenic properties after being extracted with alcohol. These antigens correspond with two different types of agglutinins—labilotrope and stabilotrope, according to the author. The labilotrope agglutinins are much more specific in typhoid than in paratyphoid infections, so that the differential diagnosis between typhoid and paratyphoid is much more easily made with fresh bacterial extracts. In the case of dysentery bacilli, which possess no flagella, only one kind of agglutinin—the stabilotrope—is formed in the serum. Alcoholic extracts of these bacteria are therefore eminently suitable for diagnostic purposes.

P. H. M-B.

ACÉL (D.) & ACÉL-VÉCSEI (Anna). **Ueber die "physiologische" Agglutination des Y-Dysenterie-bazillus.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Aug. 22. Vol. 92. No. 5/6. pp. 363–370. [7 refs.]

The authors first confirmed the observations of previous workers to the effect that serum of retroplacental origin agglutinates certain bacteria, *i.e.*, Flexner Y and *B. typhosus*, more frequently and to a greater extent than does that obtained from the umbilical cord of the child; they then proceeded to demonstrate that the agglutinins in retroplacental serum are immune agglutinins and those in umbilical serum are normal agglutinins.

This they did by showing (1) that the avidity and absorbability of the agglutinins are less in the latter than in the retroplacental serum; (2) that the agglutinins of the retroplacental serum behave like immune agglutinins in being less sensitive to heat than those of the umbilical serum which thus resemble normal agglutinins; and (3) that, while absorption with an alien organism such as *B. paratyphosus B* removes all the agglutinins from the umbilical serum, it cannot remove any from retroplacental serum.

The authors regard these immune agglutinins of the retroplacental serum as physiological. Immune agglutinins can thus arise without any specific stimulus, and such agglutinins are incapable of passing through the placenta to the foetus.

H. Schütze.

KOOSE (Werner). **Zur Frage der Agglutination von Pseudoruhrbazillen durch Schwangerensera.** [Agglutination of Pseudo-Dysentery Bacilli by the Serum of Pregnancy.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Oct. 15. Vol. 92. No. 7/8. pp. 546–572. With 7 charts in text. [124 refs.]

The conclusion of the experiments here described is that "increased physiological" agglutination of pseudo-dysentery bacilli by the serum of pregnancy was not demonstrable by critical methods.

A. Alcock.

HODER (Friedrich). **Vergleichende Untersuchungen von Coli-Dysenterie- und Paratyphusbakteriophagen.** [Comparative Investigation of Coli-Dysentery and Paratyphoid Bacteriophages.] *Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 424–436. With 4 figs. on 1 plate. [3 refs.]

From 17 different stools bacteriophages were isolated and tentatively determined. Four of them were identical with Shiga-bacteriophage and were designated δ-form. Other five were identical with Paratyphus bacteriophage and were designated B-form. One of them might be identified with Coli primary bacteriophage.

A. Alcock.

EGUCHI (Chyuroku). [**On D'Herelle's Phenomenon. I. Communication. On Bacteriophage of Dysentery Bacillus.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. June. Nos. 339/340. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 301.]

The presence of dysentery bacilli seems to bear little relationship to the presence of bacteriophage. The strength of the bacteriophage is augmented by cultivation together with the live bacilli. It possessed a marked specificity against the dysentery bacillus, but some strains had a similar effect upon the typhoid and colon bacilli. The bacteriophage itself can resist a higher temperature than the dysentery bacilli, and can be precipitated and desiccated by acetone at a low temperature. A bacillary emulsion treated with bacteriophage becomes transparent; if it is then centrifuged and washed with broth several times bacteriophage will still be present, but if saline be used it disappears at once. This is due to the absence of albumin, which seems to be necessary for the production of bacteriophage.

P. H. M-B.

KOJIMA (Katsumi). **[Experimental Studies on Bacteriophage. I. Communication.]**—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. Jan. Vol. 18. No. 1. [Summarized in *Japan Med. World*. 1924. Nov. 15. Vol. 4. No. 11. p. 297.]

In some cases of dysentery the author demonstrated a very strong bacteriophage, but the thermostability differed with each strain; some withstood heating at 85° C. for half an hour, but others were destroyed by 100° for five minutes. In some simple diarrhoeas and in typhoid fever the author demonstrated the bacteriophage; its activity was weakened by 0·5 per cent. phenol. The reactions of the medium appear to influence its activity to a great extent; alkalinity appeared to increase it, acidity to retard.

P. H. M-B.

KOJIMA (Katsumi). **[Experimental Results on Bacteriophage. II. Communication. Studies on Bacteriophage. III. Communication. On Anti-Bacteriophage Action of Bacteria and on the Mutation of Bacteria by Bacteriophage.]**—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. Mar. & June. Vol. 18. Nos. 4 & 7. [Summarized in *Japan Med. World*. 1924. Nov. 15. Vol. 4. No. 11. p. 299.]

The antibacteriophage strain of dysentery bacillus showed marked morphological and immunological changes from the normal. Many other strains underwent no such changes.

P. H. M-B.

YOSHIMOTO (S.). **Experimentelle Untersuchungen ueber den durch parentrale Injektion von Proteine (besonders Kasein) bei Kaninchen hervorgeruhenen unspezifischen bacillären Immunkörper. (I. Mitteilung).** [Investigation of Non-Specific Bacillary Immune Body resulting from Parenteral Injection of Protein, especially Casein in Rabbits.]—*Scientific Reports from Govt. Inst. for Infect. Diseases*. Tokyo. 1923. Vol. 2. pp. 139-140. [Autoreferat.]

The author made the remarkable observation that casein-serum (that is, immune serum produced by injecting rabbits with casein) acts upon dysentery bacilli in the same manner as authentic immune serum. The substance was injected intravenously into rabbits in 1 to 4 per cent. solution in distilled water on a water-bath. The dose was 1-2 cc. per kilogramme of body weight. Injections were repeated at 7-day intervals for a series of four. The resulting casein-serum does not act on other organisms than the dysentery bacillus.

P. H. M-B.

ADACHI (Kiyohisa). **[On the Classification of** *Bacillus dysenteriae*].—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1924. Aug. No. 2382. [Summarized in *Japan Med. World*. 1924. Dec. 15. Vol. 4. No. 12. p. 326.]

Adachi considers that all the dysentery bacilli may be grouped into the following three groups:—

A Type, including Shiga's bacillus.
B type, including Hiss' bacillus, Flexner's bacillus and allied strains.
C type, including the author's "Ohara strain."

P. H. M-B.

KASAI (Keijiro). [**Catalase Reaction of** *Bacillus dysent*[illegible]*ae*, **together with a New View on the Classification of the Dys**[illegible]**y Bacilli.**]—*Iji-Shimbun* (*Med. News*). 1924. July. No. [illegible] Summarized in *Japan Med. World.* 1924. Oct. 15. Vol [illegible] 10. p. 261.]

The author attempted to classify dysenter[illegible]y the catalase reaction and divided them into the following [illegible] *B. dysenteriae*, Shiga-Kruse ; *B. paradysenteriae* A, Y & F (Flex[illegible] *paradysenteriae* B, Ohhara, Minoda and other strains.

P. H. M-B.

WATANABE (Kohei), HASEGAWA (Kamenosuke), N[illegible]AMURA (Shinro), KOHNO (Yuji) & KAWAGUCHI (Itsu). [**On the Types of Dysentery Bacilli which cause Epidemics of Dysentery in Tokyo.**] *Igaku Chuo Zasshi* (*Central Jl. of Med.*). 1924. Aug. Vol. 22. No. 2. p. 330. [Summarized in *Japan Med. World.* 1924. Dec. 15 Vol. 4. No. 12. p. 330.]

The authors investigated 286 strains of dysentery bacilli collected from cases in Tokyo and classified them after FUTAKI's method :—

77·1 per cent. belonged to Komagome B type.
21·7 per cent. ,, ,, A ,,
1·05 per cent ,, Shiga type.

P. H. M-B.

TANAKA (Iwawo). [**On the Strain of Dysentery Bacillus, which does not decompose Mannit.**]—*Jikken Igaku Zasshi* (*Jl. of Experim. Med.*). 1924. Apr. Vol. 8. No. 4. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 268–269.]

The author found 15 strains of dysentery bacillus (out of 106 cultures obtained from various laboratories) which do not ferment mannite ; with these he deals at length.

P. H. M-B.

OH (Soki). [**Precipitin Reaction applied to the Typhoid and Dysentery Diagnosis.**]—*Eiseigaku Densenbyogaku Zasshi* (*Jl. of Hyg. & Infect. Dis.*). 1924. Apr. Vol. 19. No. 4. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 302.]

From experiments on a limited number of cases the author observed that an emulsion prepared from the faeces of typhoid and paratyphoid A and B formed a precipitate if brought into contact with a homologous serum and gave a negative result with control serums. Faecal infusions from dysentery cases did not give such a clear-cut reaction as did those of typhoid.

P. H. M-B.

KAWAMURA (Hideku) & TSUCHIYA (Kinichiro). [**On the Estimation of the Efficacy of Dysentery Serum. I. Communication. Preparation of Dysentery Toxin and its Serological Test.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. June. Nos. 339/340. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 301.]

After 2-3 hours cultivation of dysentery bacilli in broth, a gradual increase in acidity was noted and the maximum reached in 6-7 hours. After one or more days the hydrogen-ion concentration was seen to fall gradually and the medium becomes alkaline until the maximum—pH 8·6—is reached. Shiga bacilli showed marked constancy in this respect. The virulence of the bacillus increases relatively to the increase of alkalinity and the maximum alkalinity corresponds with the maximum toxicity.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

BOLTON (J. SHAW) & MCGRATH (M. J.). **Asylum Dysentery and Allied Infections (Fifth Post-War Report).**—*Tenth. Ann. Rep. of the Board of Control for the Year 1923. Lunacy & Mental Deficiency.* pp. 79–81. 1924. H.M. Stationery Office.

The studies on the duration of agglutination produced by inoculations are completed in this report. The net result goes to show that agglutination indicates a vital reaction on the part of the subject, not merely a chemical one, and its titre and its duration depend more upon the idiosyncrasy of the animal than upon the dose or the nature of the emulsion.

The serum of a Flexner-injected animal agglutinates more easily than the others, the animal can withstand a maximum dose, and maintains a moderate titre for months afterwards.

During the year no dysentery or enteric bacillus has been isolated at autopsy, while a noteworthy decrease in less pathogenic organisms such as Morgan I and *Bacillus faecalis alkaligenes* has taken place. The authors regard an agglutination titre of 1/50 and 1/100 as constituting a safe diagnostic standard. In the case of typhoid injections, a positive agglutination means a present or relatively recent attack of the disease. On the other hand in the case of the dysentery group, whenever one or more cases are found, numerous contacts also give positive agglutination.

P. H. M-B.

WATSON (G. A.). **Dysentery.**—*Tenth Ann. Rep. of the Board of Control for the Year 1923. Lunacy & Mental Deficiency.* pp. 81–82. 1924. H.M. Stationery Office.

At the Rainhill Mental Hospital a smaller number of cases of dysentery was recorded in 1923 than for many years past, and those were sporadic and of a mild type. For the first time for over 20 years no deaths were attributable to this disease. The total number of cases was 20, 13 males and 7 females. In 2 males and 1 female active forms of *Entamoeba histolytica* were found, in 8 males and 5 females Flexner's bacillus, in 3 males and 1 female Strong's bacillus. In addition, there were 10 patients who suffered from colitis with blood and pus, from whom no pathogenic organism was isolated. 146 individuals, mostly those who had in previous years suffered from dysenteric attacks, were examined: one was found to be excreting cysts of *E. histolytica.* No carrier of the dysentery bacillus was discovered.

P. H. M-B.

MÜLLER (J.). **Zur Klinik und Therapie der Dysenterie im Säuglings- und Kindesalter.** [Symptoms and Treatment of Dysentery in Infants and Children.]—*Arch. f. Kinderheilkunde.* 1924. Vol. 74. No. 2/3. pp. 115–129. [19 refs.]

Under the heading of dysentery in infants and children it is necessary to include a number of mild infections which do not exhibit the symptom-complex of bloody stools, abdominal pain and tenesmus. Conditions such as abdominal tuberculosis, intussusception, intestinal polypi, prolapse of the bowel and anal fistula may simulate true dysentery very closely indeed. A slimy bilious stool, or a massive evacuation containing small flecks of mucus and blood, is suggestive of dysentery, though it is not unusual for blood and mucus to be absent altogether. The causative organism is not always easy to demonstrate, but in favourable cases it can be isolated in 50 per cent. *The agglutination reaction also is unreliable,* esp[illegible]lly *in children*; under six months of age no reaction can be exp[illegible] in older infants it does not appear for 2-3 weeks. For posi[illegible]nosis a titre of 1 : 200 is necessary.

Bacillary dysentery is a disease of warm [illegible] The incidence in Düsseldorf during the summer of 1923 [illegible]d in June and reached its maximum in August and September (138 out of a total of 179), when the death rate, 25, was highest. The rapid spread of the disease, especially in the poorer overcrowded quarters amongst members of the same family, was very noticeable.

One of the toxic manifestations of dysentery is seen in the stimulation of the vagus, resulting in slowing of the pulse-rate, intestinal colic and tenesmus, and probably also failure of the gastric secretion and the vomiting so often observed in children. Atony of the bowel rarely occurs. The toxic effect upon the sympathetic system is seen in the vasomotor instability. In mild cases the symptoms of intestinal toxaemia alone are apparent, the nervous manifestations being altogether absent (81 out of 148 cases belonged to this category). Relapses may take place and prove fatal. In the mild form convalescence is usually complete within 8-10 days. In the more serious form there is a more noticeable disturbance of health; blood and mucus stools persist for 10-20 days; nervous manifestations are present, while convalescence is not complete for 3-4 weeks. Forty-eight cases were included in this series; there were no deaths and no relapses. The really acute cases commence suddenly and symptoms of toxaemia soon manifest themselves. Hydraemia rapidly takes place. Pyrexia is usually present. Six of these cases were observed, and all ended fatally within four days. The infecting organism was in each instance the Shiga-Kruse bacillus. When the higher nervous centres are affected so as to produce delirium or coma the outlook is very unfavourable. On the whole, delirious cases run a more favourable course than those with stupor. The mortality in Shiga-Kruse infections was 9 out of 72, as compared with Flexner infections, 1 out of 6. In small infants the disease generally runs a very mild course; a few slimy stools and mild degree of pyrexia may be the sole symptoms noted. As regards prognosis, the death-rate was found to be highest during the first year of life; 6 out of 26 deaths were noted from 1 to 2 years; after that, up to the age of 11 years, the numbers gradually decreased.

The author has little to say on the subject of treatment. Antidysenteric serum, on account of the frequency of serum-sickness, he has long since abandoned.

P. H. M-B.

HAUGHWOUT (Frank G.). **Some Departures from the Typical Cell Picture of Bacillary and Amoebic Dysentery, with Speculations as to their Significance. I. Observations on some Post-Bacillary Exudates, and on the Presence of Eosinophiles in Intestinal Allergy.**—*Philippine Jl. Sci.* 1924. Oct. Vol. 25. No. 4. pp. 513–537. With 8 plates. [7 refs.]

In the microscopic study of the faeces in subjects of bacillary dysentery we have to deal with two distinct cell pictures. Firstly, that presented by the more or less regressive cytological changes characterized by a decline in the number of endothelial macrophage cells and evidences of toxic necrosis in cells of all types; secondly, the expression of a residual purulent process in unhealed areas of the colon in which *B. dysenteriae* plays little, if any, part. In the latter stage the annular degeneration of the leucocyte nuclei becomes less marked, and they tend to regain their usual lobed and homogeneous appearance. This stage, in some instances, is succeeded by a desquamative process in the colon in which large numbers of columnar epithelial cells are cast off. The author does not believe that chronic bacillary dysentery is of frequent occurrence. The chronic processes following acute bacillary dysentery are caused by organisms or conditions bearing no relation to the activities of the dysentery bacillus.

There are two general types of exudate in amoebic dysentery. One is almost devoid of cellular elements and, apart from the entamoeba, is usually seen in the first attacks of amoebic dysentery, and signifies that there is little secondary bacterial infection of amoebic ulcers. The second is the characteristic stool of chronic amoebic dysentery and the evidence of secondary bacterial infection of amoebic ulcers is afforded by numerous polymorphonuclear leucocytes.

P. H. M-B.

MARCHOUX (E.). **Action du Stovarsol sur le parasitisme intestinal.**—*Paris Méd.* 1924. Nov. 22. 14th Year. No. 47. pp. 421–426.

The author gives a considerable list of authorities besides himself who have used stovarsol with great success in the treatment of amoebic dysentery, and in some instances giardiasis and balantidiasis, and he now reports some more results of its remarkable utility.

Of 59 cases of intestinal amoebiasis—mostly old cases that had already suffered much and varied treatment—57 were cured by a course of stovarsol, the 2 incurable cases being also resistant to every other appropriate kind of treatment. In the successful cases cysts or amoebae disappeared in two or three days, and recovery was complete in about a week—as judged by subsequent observation for six weeks. The duration of the stovarsol course was six weeks. For recent cases the course consisted of 0·5 gm. stovarsol daily for the first three weeks and 0·25 gm. daily for the last three weeks. For old chronic cases the course began with 0·5 gm. on the first day, increased to 1 gm. on the third and fourth days, then 1 gm. every second day until the eighth, then 0·75 gm. every second day for a week, reduced to 0·5 gm. for another week, and finally 0·25 gm. daily for three weeks. The drug was given in tablet form with meals. No special dietary was ordered; but tobacco, butter, and wine and fermented liquor were forbidden. And any concurrent dyspepsia was appropriately treated.

In 21 cases of giardiasis the symptoms and condition of the patient were always ameliorated, and in some cases the parasites disappeared quickly, but in others their disappearance was only temporary. The stovarsol course here was of the interrupted kind; it began with respective doses of 0·5 gm., 0·75 gm. and 1 gm. daily on the first 3 days, and continued with 1 gm. daily for the next 3 or 4 days; then an interruption for 4 days, then a repetition, and so on for 3 weeks.

Blastocystis, which, when it is extremely abundant, the author regards as causing irritation and diarrhoea, disappears completely after small doses of stovarsol.

Divers bowel complaints and attendant toxic neuralgias are relieved by stovarsol, which the author believes to act by activating the digestive ferments while sterilizing the waste products of their action.

A. Alcock.

JACOBI (Erich). **Erfolge mit Yatren bei Ruhr.** [Yatren Treatment of Dysentery.]—*Deut. Med. Woch.* 1924. Nov. 21. Vol. 50. No. 47. p. 1614.

Yatren (oxychinolin-sulphonic acid combined with 30 per cent. iodine) is specific for amoebiasis, but it is useful also for bacillary dysentery. For this purpose the drug is given in cachets, each containing 0·5 gm. of yatren. Four of them are given the first day, six on the three succeeding days, afterwards four. Altogether 40 cachets should be administered. No ill-effects have been noted. An illustrative case is cited of the success of this drug where such remedies as tannalbin, opium, bolus alba, etc., had failed. Yatren also appears to be successful in eradicating the dysentery bacillus from " carriers " of the infection.

P. H. M-B.

HINES (Laurence E.). **Kaolin in Chronic Dysentery.**—*Proc. Inst. of Med. Chicago.* 1924. Vol. 5. No. 1. pp. 63–66. [6 refs.]

Kaolin is a form of purified clay, and is composed essentially of hydrous aluminium silicate. Recently it has been credited with curative powers in intestinal diseases, especially cholera. In studies with BRAAFLADT kaolin was fed to white rats, dogs and normal men in order to study the consequent changes in the intestinal flora. Rats and dogs after a diet of 2 gm. of kaolin daily for 16 days developed a predominantly aciduric flora. A change from a proteolytic to an aciduric type of flora was observed in the stools of four healthy men. Kaolin also absorbs toxins. Kaolin was administered to 10 patients in a dose of 30 gm. of kaolin powder, emulsified in water, twice daily. The cases were of a varied description—such as tubercular enteritis, amoebic dysentery and mucous colitis. Of these, six who had definite ulcerative lesions of the intestines showed clinical improvement after taking kaolin, as manifested by the decrease of the diarrhoea and relief from abdominal pain. Two patients who had no evidence of intestinal ulceration also improved as the flora became more aciduric. The results suggest that kaolin does not produce an aciduric flora in chronic dysentery as readily as in normal men or laboratory animals. It seems that kaolin is worthy of a further trial in the treatment of chronic dysentery. [See also this *Bulletin*, Vol. 21, p. 395.]

P. H. M-B.

EVANS (Thomas Carey). **The Surgical Treatment of Chronic Ulcerative Colitis.**—*Brit. Med. Jl.* 1925. Jan. 31. pp. 204–205.

The medical treatment of chronic ulcerative colitis is extremely unsatisfactory. The majority of the cases of colitis seen by the author in Mesopotamia were chronic and complicated by scurvy, which as a rule rendered the condition most intractable. Appendicostomy was performed in 10 intractable ulcerative cases—Turks, Arabs and Indians. After a few irrigations of the large intestine the patients began to show remarkable improvement. The immediate results were excellent, but it soon became obvious that lavage had to be persisted in for prolonged periods. A case is cited in which amoebic ulcerations were verified by the sigmoidoscope. As the patient was not doing well a valvular caecostomy was performed, No. 12 rubber catheter introduced, and the bowel washed out with saline. The final result was very satisfactory, the patient having increased 2 st. in weight. The author concludes that cases of colitis persisting two or three months without intermission and with profound emaciation and not responding to medical treatment should be handed over to the surgeon, since whatever the organism which caused the primary infection may have been they are, in this stage, examples of mixed infection. The only rational treatment, when the diagnosis is confirmed, is frequent irrigation of the large intestine, either through an appendicostomy or a valvular caecostomy, with eusol solution until the washings are clear.

P. H. M-B.

HARA (Minoru). **[On the Type of Fever in Infantile Dysentery and Ekiri.]**—*Iji-Shimbun* (*Medical News*). 1924. Sept. No. 1147. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 329.]

In 70 per cent. of cases of infantile dysentery the body-temperature rose abruptly, but fell in 2-3 days from onset of symptoms ; should the latter be severe it rises again on the 4th-5th day.

P. H. M-B.

REICHER (K.). **Zur Therapie der akuten und chronischen Dysenterie, Kolitis, Sigmoiditis und Proktitis.**—*Muench. Med. Woch.* 1925. Feb. 13. Vol. 72. No. 7. pp. 261-262. [16 refs.]

This paper extols the virtue of an extract of camomile, camillosan, in the treatment of dysentery and colitis, exhibited as a powder for rectal insufflation or in liquid form as enema.

P. H. M-B.

LE NOIR (P.) & DESCHIENS (R.). **Infestations intestinales par** *Trichomonas intestinalis* **et entérites.**—*Arch. des Malad. de l'Appareil Digestif.* 1924. Dec. Vol. 14. No. 10. pp. 919-922.

Notes of 10 cases of colitis or dysenteriform diarrhoea associated with infestation by *Trichomonas intestinalis*, 2 of them complicated with *Entamoeba histolytica*, and 2 with *Giardia intestinalis.* In the six pure Trichomonas infestations the symptoms were constant or remittent diarrhoea (3 or 4 soft stools a day), colic generally localized about the sigmoid flexure, and loss of flesh ; the stools contained mucus and mucoid lumps, and the flagellates were numerous in the mucus and liquid parts ; in one instance ingested red blood cells were seen in flagellates. Essence of turpentine in a gummy vehicle was given to the three cases that stayed for treatment ; two of them were

" ameliorated in 15 days " by this treatment, but in the third auxiliary lavage with protargol was necessary. The author emphasizes the significance of gum in treating these flagellate infestations.

A. Alcock.

ROUX (Jean Charles). **Note sur certaines entérites à flagellés** *Tetramitus mesnili.—Arch. des Malad. de l' Appareil Digestif.* 1924. Nov. Vol. 14. No. 9. pp. 836–839 (Discussion pp. 839-841). [2 refs.]

An interesting story of three cases of violent and inveterate diarrhoea, associated with enormous numbers of " Tetramitus " in the stools, two of which are stated to have been cured by an ingenious novel device. The circumstances appearing unfavourable to a trial of ESCOMEL'S treatment by iodine enemata and strong doses of turpentine, or of HEGNER'S suggested treatment by a diet of flesh, it occurred to the author to try the effect of " modifying the intestinal medium " by administration of mucilage. The patients were therefore given one to two teaspoonfuls of mucilage daily. Under this treatment the parasites became obviously encumbered and finally disappeared altogether in 1, 2 and 6 months respectively. After their disappearance ordinary treatment for the colitis was completely successful in one case and slowly successful in another, but in the third case was followed by a reappearance of the parasites after an interval of 15 days.

A. Alcock.

DOPTER. **La balantidiase (étude étiologique).**—*Ann. de Méd.* 1924. Oct. Vol. 16. No. 4. pp. 247–260. [72 refs.]

A full and uncommonly good account of the geographical distribution and etiological history of balantidiasis. It does not contain anything new, but it may be useful here to extract some particulars of the geography of the disease and the xenography of the parasite (*Balantidium coli*).

The disease is widely distributed in Europe, Asia, Africa, and America. In Europe the countries included in this record are Austria, Balkan States, Finland, France, Germany, Hungary, Italy, Norway, Poland, Russia, Sweden. In Africa ; Algeria, Morocco, and the Red Sea coast. In America ; the U.S.A., Central America and the West Indies, Brazil, Guiana, and Venezuela. In Asia ; Cochin China, India, Siam, Tonkin, and some of the islands of the Malay Archipelago.

The hosts in which the parasite has been found are, besides pig and man, captive apes and monkeys (orang, macaque, baboon).

A. Alcock.

DANISCH (F.). **Balantidiencolitis kombiniert mit Typhus abdominalis. Bemerkungen zur Biologie und pathogenen Bedeutung des** *Balantidium coli.—Cent. f. Bakt.* 1. Abt. Orig. 1924. June 16. Vol. 92. No. 1–2. pp. 104–115. With 4 text figs. [44 refs.]

A brief abstract of a fatal case, diagnosed clinically as typhoid fever and found afterwards to be that disease superposed upon a very fell infection of *Balantidium coli*, is followed by a prolonged description and discussion of the latter infection and its destructive effects upon the colon and rectum. In the colon were seen numerous necrotic ulcers, ranging in size from a pea to a shilling, crowded or confluent, and eroding the coats of the gut almost to the perforation-point; similar ulcers, not so numerous and not reaching such a large size, existed in the rectum. In sections of the colon balantidia were found in the Lieberkühnian follicles, in the submucous and muscular coats, and even in the subserosa. The author discusses the pathogeny of Balantidium and concludes that the organism becomes pathological only when the contents of the large intestine—normally acid—become alkaline.

A. Alcock.

NORD (Folke). **Fall av balantidiumcolit behandlat med emetin.** [A Case of Balantidium Colitis treated with Emetine.]—*Hygiea.* 1924. Nov. 30. Vol 86. No. 22. p. 826.

The patient was a man of 65. At the age of 40 he began to get periodic diarrhoea. He had 2 or 3 loose motions a day, sometimes attended by slight pain in the abdomen. The trouble gradually increased during the succeeding years, but latterly he had not usually had more than one motion a day until two months before admission to hospital, when his condition got considerably worse. He had more than one motion an hour both day and night, and occasionally drops of fresh blood were present. On admission he was ashy-grey in appearance. The faeces were greyish-brown, of the consistence of thick soup, foul-smelling, and contained a few *Balantidium coli.* Next day Balantidium was present in large numbers. The colon was washed out with solutions of tannic and acetic acid, and the condition speedily improved so that he could be discharged in about a month. The parasite disappeared from the faeces. He was taken into hospital again 8 months later for a relapse and large numbers of *Balantidium coli* were present. For the first three days he was treated as before but afterwards by subcutaneous injections of emetine, 3 cgm. twice daily. As there was little improvement in a week the dose was increased to 5 cgm twice daily for 5 days, when the injections were stopped. From that time no more parasites could be found and the faeces remained formed. No other treatment except a suitable diet and rest in bed at first was given. A few months after discharge from hospital he was having one or two motions a day of normal consistence.

The emetine cured the patient in a relatively short time. Whether the parasite was really got rid of, it is not possible to decide at present, as the patient has not been observed for a sufficiently long time. There were no after-effects from the emetine injections and absolutely no discomfort.

E. E. Atkin.

i. CARRUYO (Jesús). **Hepatitis supuradas tratadas con exito por el metodo de Rogers.**—*Rev. Med. y Cirug.* Caracas. 1924. Aug. 31. Year 7. No. 77. pp. 210–211.

ii. MONDOLFO (Emanuele). **Focolai di amebiasi in Romagna.**—*Policlinico.* Sez. Prat. 1925. Jan. 19. Vol. 32. No. 3. pp. 85-87.

iii. DA CUNHA (Aristides Marques). **Diagnostico e tratamento da dysenteria amebiana.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 532–537. With 1 plate.

iv. FURUTAMA (Taro). **On the Carriers of Amoeba-Cysts in Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1924. Sept. No. 236. English summary pp. 3–4. [In Japanese.]

v. HOUSSIAU (F.). **Diarrhées dues à l'Amaeba Coli.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 191–192.

vi. HEINEMANN (H.). **Zur Diagnose und Therapie der chronischen Amöbiasis.**—*Arch. f. Verdauungs. Krankht.* 1924. June. Vol. 33. No. 3/4. pp. 203–214.

vii. FIGDOR (Philip). **Treatment of Chronic** *Entamoeba histolytica* **Infection.**—*Jl. Clin. Res.* 1924. Apr. Vol. 10. No. 2. pp. 37–42.

viii. STRAUB (M.). **Amoebiasis penis (venerica !).**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 989–990. With 1 plate.

i. Two cases of suppurative hepatitis are briefly described, in one of which the abscess opened into the lung. Treatment by injections of emetine hydrochloride, 5 cgm. twice a day, and ipecacuanha by mouth was undertaken, and both were cured in a fortnight without operative measures.

ii. The author, after referring to two cases of amoebic dysentery in Cesena previously described, relates three more in the present paper to prove that the disease does undoubtedly exist in Romagna, a fact which some have denied.

iii. An item of possible interest in this paper is the statement that an extract of *Garcinia composita,* a plant of the order Clusiaceae, given in doses of 6-12 spoonsful daily in coffee for two days in acute cases, 3-6 daily for five days in chronic cases, is useful in the treatment of amoebic dysentery.

H. Harold Scott.

iv. An investigation of the percentage of amoeba "carriers" amongst apparently healthy people in Formosa was undertaken ; 54 were examined, half Japanese and half Formosans.

E. histolytica cysts were found in 3·7 per cent ; *E. coli* in 9·2 per cent ; *I. bütschlii* in 3·7 per cent. ; *E. nana* in 5·5 per cent.

v. Two cases of simple diarrhoea in children of two to three years of age are described and attributed to *Amoeba coli.*

vi. This paper is a résumé of the recent literature and contains no original observations.

vii. Contains no novel information.

P. H. M-B.

viii. After coitus per anum four years ago, a Chinese suffered from a relapsing inflammation of the penis. There was an ulceration of the glans penis, containing *Entamoeba histolytica.* The ulcer quickly healed under treatment with emetine injections and has not relapsed since.

W. J. Bais.

DUTTON (L. O.). **Technic for the Bacteriologic Diagnosis of Bacillary Dysentery.**—*Jl. Lab. & Clin. Med.* 1924. Apr. Vol. 9. No. 7. pp. 463–468.

FUJITA (Koshiro). **Ueber ein heterogenetisches Antigen in Shiga-Dysenteriebazillen.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil Orig. 1924. Dec. 10. Vol. 41. No. 6. pp. 539–556. [13 refs.]

IACONO (Igino). **Cura della colite amebica.**—*Riforma Med.* 1924. Dec. 1. Vol. 40. No. 48. pp. 1137–1138.

PETZETAKIS. **Amoebic Bronchitis and Frequent Presence of Live Entamoebae in the Sputum and Urine during Acute Amoebic Dysentery.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 1. Vol. 27. No. 7. pp. 74–75. [1 ref.]

SUZUKI (Tadashi), with TOKUYE (K.) & HATAI (K.). **De Verspreiding van Bakteriophagus in Dysentery-Faeces van Kinderen.**—*Jl. Oriental Med.* Dairen. 1923. Nov. Vol. 1. No. 4. pp. 137–140.

YU (Ilchum). **Vergleichende biologische, serologische und kapillar-chemische Untersuchungen an Varianten der Typhus-Paratyphus-Ruhr-Gruppe.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1924. Nov. 25. Vol. 41. No. 5. pp. 393–430. With 1 text fig. [157 refs.]

SPRUE.

SMITH (Lawrence Weld). **The Rôle of** *Monilia Psilosis* **(Ashfordi) in Experimental Sprue. Including Mycologic Observations on Twenty-One Strains of Monilia.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 15. Vol. 83. No. 20. pp. 1549–1554. With 5 text figs. [24 refs.]

This investigation was prompted by the discovery of *Monilia psilosis* in certain fatal cases of anaemia, in Manila, presenting the clinical picture of sprue. The strains of monilia were obtained from these cases and also those of ASHFORD from Porto Rico. Other strains were obtained in Boston from two sprue cases and from the large intestine of an infant who died of a persistent diarrhoea. The identification of Monilia was based on ASHFORD'S criteria, viz.: the carbohydrate reactions, the "inverted pine-tree" appearance in gelatin, the growth on Sabouraud's medium, and the microscopic appearance of the yeast cells themselves. Specific complement fixation occurs for *M. psilosis* in animals, regardless of how immunization is attempted, but no such reaction follows injection with *M. albicans*; the latter is, therefore, non-pathogenic. Agglutination tests have been discarded as of no value. A table is given illustrating the more important cultural characteristics of the strains studied. According to ASHFORD, the carbohydrate reactions of *M. psilosis* are constant, but the author finds that old subcultures lose their ability to ferment carbohydrates with gas-production, though animal passage restores their fermentative reaction.

The production of mycelium represents the resistant stage of the organism and occurs only in old subcultures; this would explain the intermittent character of the symptoms in the early stages of the diarrhoea; the frothy motions accompany the yeast cell production, the remissions the mycelial phase. In the case of *M. psilosis* intraperitoneal injection of 2 cc. of a saline suspension of the organism into guineapigs is followed, some 48-72 hours afterwards, by the development of definite mycotic abscesses. Intravenous injection of 5-10 cc. produces a septicaemia in 24-72 hours, but *M. albicans* is far less virulent and may sometimes produce a septicaemia with lesions of the liver from which the organism may be recovered. After various attempts the intraperitoneal and intragastric method of inoculation were chosen as the best routes in monkeys. The latter was effected by the use of a catheter attached to a syringe whereby 10 cc. of a Monilia suspension could be introduced into the stomach. In five monkeys a moniliasis of the gastro-intestinal tract was induced which persisted for several weeks, and the organisms were recovered regularly from the stools. Four showed no symptoms save a temporary frothy diarrhoea. A fifth developed pyrexia and diarrhoea, death eventually taking place from bronchopneumonia. The Monilia was recovered from the ileum and colon. The mucosa of the intestines was moderately injected, and several small, superficial ulcers were found in which mycelium was demonstrated histologically.

Intraperitoneal inoculation of 24 guineapigs with *M. psilosis* produced a moniliasis which persisted from 8-12 weeks on the average. In two cases cultures were positive after five months. At autopsy of these animals definite lesions of the gastro-intestinal tract were demonstrated, as well as small aphthous ulcers of the tongue. On a scorbutic, vitamin-deficient diet composed of soy-bean, flour and butterfat a series of 20 guineapigs was inoculated by the oral and intraperitoneal routes. The results were most suggestive ; a moniliasis of the gastro-intestinal tract ensued, and with *M. albicans* patches of "thrush" appeared on the tongue. Of 12 animals inoculated with *M. psilosis*, two recovered after 3-4 months of intermittent diarrhoea accompanied by loss of weight. The others died at varying intervals following inoculation, two in less than one week from generalized *M. psilosis* septicaemia. At necropsy of the remainder the pathological changes were striking and uniform. The lesions were found in the tongue, ileum and colon. The mucosa of the tongue presented white thrush-like membrane and small aphthous superficial ulcers ; in some of these penetration by mycelium was observed. In the intestine similar superficial ulcers were found in the terminal ileum and colon, especially in relation to the lymphoid structures. Examination of the blood never revealed a degree of anaemia comparable with that found in human cases of sprue in Manila. The pathogenicity of *M. psilosis* appears to be very slight, except in a suitable soil, which appears to be an avitaminosis, or a calcium deficiency dependent on excessive fat or protein dietary. These experiments support ASHFORD's claim for the specificity of *M. psilosis* as the chief causative factor in sprue.

P. H. Manson-Bahr.

ELDERS (C.). **Tropical Sprue and Pernicious Anaemia. Aetiology and Treatment.**—*Lancet*. 1925. Jan. 10. pp. 75–77. [12 refs.]

Since 1916 the author has been convinced that sprue is a deficiency disease. In many cases the blood picture cannot very well be distinguished from pernicious anaemia, nor can always the tongue changes. In sprue, as in pernicious anaemia, there is often no hydrochloric acid in the gastric juice. As there are such slight differences between the two diseases, if one is a deficiency disease, the other should be also. Even symptoms such as pigmentation, petechiae and mental disturbances may be found occasionally in sprue.

Though the degeneration of the posterior columns of the cord, which occurs in a certain proportion of cases of pernicious anaemia, has not been found in sprue, yet the author has seen a case of sprue with ataxia and anaesthesia of both legs. From the records of sprue cases he has been able to show that the patients have lived upon an unbalanced diet before contracting the disease, and it is a well-known fact that the food of Europeans in the Dutch Indies contains too much cured rice and canned meat. During the past ten years he has not lost a single case of sprue. The diet has consisted of underdone meat up to a kilogramme or more, 1½-2 litres of raw milk with lime water 5 times a day, cod liver oil, oranges and strawberries. Cases of pernicious anaemia also improve. Three cases are cited, one of pernicious anaemia and two of sprue, to illustrate the improvement in the blood count and in general condition of patients on this diet. In case (1)—pernicious anaemia—the haemoglobin percentage increased from 20 per cent. to 76 per cent., the red blood corpuscles from 980,000 to 4,450,000. In case (2)—sprue—the haemoglobin from 51 per cent. to 77 per cent., red cells from 1,270,000 to 4,000,000 ; in case (3) the haemoglobin from 35 to 80 per cent., red cells from 1,460,000 to 4,900,000.

P. H. M-B.

HUNTER (William). **Blood Changes in Sprue and Pernicious Anaemia.** [Correspondence.]—*Lancet.* 1925. Jan. 31. pp. 255–256.

Hunter, referring to ELDERS' paper (see above), criticizes some of the calculations made from the published blood counts. He points out that in every case the figures of colour-index are one-fifth to one-third higher than they should be, according to accepted standards. According to this calculation, the colour-index in sprue was above normal only in three counts out of twelve, whereas in the pernicious anaemia cases it was above normal in four out of the six counts. Of all the blood changes in pernicious anaemia the most constant feature is the high colour-index. In 200 cases it has been found to be above normal in 83 per cent., normal in 7, and below normal in only 10 per cent. of counts. In other cases of severe anaemia the colour-index is above normal only in 12 per cent., normal in 28, and below normal in no fewer than 60 per cent. of counts; average 0·8. This latter class of case is known as septic anaemia; therefore the sprue anaemia belongs to this type.

P. H. M-B.

WOOD (Edward Jenner). **Pernicious Anemia in its Relationship to Sprue.**—*Amer. Jl. Med. Sciences.* 1925. Jan. Vol. 169. No. 1. (No. 634). pp. 28–38. [21 refs.]

Sprue first attracted attention in the United States when pellagra made its appearance in the Southern States in 1907. Probably the cases tentatively diagnosed as pellagra-sine-pellagra were examples of this disease, but such confusion could not have existed had the blood-picture been considered, which in sprue is so strikingly similar to that of pernicious anaemia. The lack of nervous changes in sprue has been regarded as a point of distinction; it is an error to think that the nerves always escape, as in the case of a lady from Porto Rico who suffered from sprue-like symptoms together with those of subacute combined degeneration of the cord. Very often sprue develops into pernicious anaemia. Achylia gastrica is so frequent in pernicious anaemia that it has been regarded as offering a point of differentiation from sprue. It seems that in the latter it does occur, but later in the course of the disease. The author has discovered the *Monilia psilosis* in the faeces of 15 cases of pernicious anaemia. By feeding guineapigs with cultures of the organism a haemolytic anaemia was produced with changes in the liver and bone marrow suggestive of the action of a haemolytic poison, while a filtrate of *Monilia psilosis* in dextrose water injected intravenously into rabbits caused blood changes which were apparently haemolytic in nature.

P. H. M-B.

BANA (F. D.). **Treatment of Sprue with Calcium and Parathyroid Extract.**—*Brit. Med. Jl.* 1925. Jan. 17. pp. 111–112.

The author thinks that sprue is due to exhaustion of nerve centres or endings in the viscera in general, but particularly in the intestine. The lack of certain principles may affect other nerves, such as the auditory, when deafness and tinnitus are produced. Details are given of a case of sprue in a European in which marked symptoms of that disease and auditory phenomena were present.

[From the clinical account of the case it is by no means convincing that the patient was benefited by the calcium treatment, nor does it bear out the contention that the nerves themselves are involved.]

P. H. M-B.

ANDERSON (D. Drysdale). **Sprue and Parathyroid.**—*St. Bartholomew's Hospital Jl.* 1925. Feb. Vol. 32. No. 5. pp. 73–74. [2 refs.]

Clinical record of a case of sprue in a native-born Mexican woman who, after the birth of her third child, began to suffer from aphthous ulcers in her tongue and mouth and passed frothy, bulky, clay-coloured stools. A great improvement took place on extract of parathyroid gr. 1/10th twice daily from October, so that by the end of the year she was restored to health. No calcium salt was prescribed with the parathyroid, as the diet was considered to contain sufficient.

P. H. M-B.

BRITISH MEDICAL JOURNAL. 1924. Nov. 29. p. 1001.—**Parathyroid Extract in Sprue.** [Memoranda.]

This is a report based upon notes supplied by Dr. D. HENNESSY, of Penang, and affords an example of the rapidity with which sprue symptoms clear up when treatment with parathyroid is undertaken in the early stages of sprue.

Diarrhoea commenced in June, 1924, and the patient, a lady, aged 28, has lost 16 lbs. in weight in ten weeks. Treatment commenced on September 3rd with milk and lime water. Parathyroid extract gr. 1/10th was given twice daily. Six days later, all diarrhoea and discomfort had ceased and the stools were regaining their colour. Nineteen days after commencing treatment the patient left hospital to resume her work.

P. H. M-B.

HARMSEN (E.). **Sprue (Aphthae tropicae).**—*Therap. der Gegenwart.* 1924. Oct. Vol. 65. (New Series. Vol. 26). No. 10. pp. 447–452.

A clinical commentary on a case of sprue observed in Bremen in a patient from Shanghai. It comprises also a review of the literature and a summary of methods of treatment.

P. H. M-B.

GULLY (Percy). **Pernicious Anaemia, Sprue and the Enteric Group.** [Correspondence.]—*Lancet.* 1925. Feb. 7. p. 308.

SCOTT (H. Harold). **The Treatment of Sprue: Based on a New Theory of Causation.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 308–317.

PLAGUE.

BLAZY. **La faune des rongeurs et de leurs parasites cutanés qui interviennent, au Sénégal, dans la propagation de la peste; sa répartition topographique, ses variations et ses rapports avec les manifestations pesteuses.**—*Bull. Office Internat. d' Hyg. Publique.* 1924. Dec. Vol. 16. No. 12. pp. 1483–1502. [4 refs.]

The rodents susceptible to plague and liable to spread the disease in Senegal are: *Mus rattus*; *M. alexandrinus*; *M. decumanus*; *M. concha*; *M. golunda campanae* (E. ROUBAUD) and *M. musculus*.

Golunda, generally a rat of the fields and the "bush," does not hesitate to enter inhabited areas and then lives in contact with house rats. The shrew *Crocidura stampflii* is included since it is frequently found dwelling with plague rats, and may easily be a carrier of infected fleas [see this *Bulletin*, Vol. 19, p. 367 (LEGER & BAURY)]. The flea generally found on the rats is *Xenopsylla cheopis*, and on rare occasions *Sarcopsylla penetrans* occurred. Those who desire statistics will find in this paper Tables giving percentage parasites on various rats for August-September of 1924; comparative records of human and rodent plague; and percentage of infected rats among those examined from October, 1921, to December, 1922. [See this *Bulletin*, l. c. pp. 367–368 (TEPPAZ, NOC, RIGOLLET).]

J. H. Tull Walsh.

MORA (A. Damas). **La peste en Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 315–329.

As the author states, the true value of this report is that it brings together epidemiological observations collected since plague entered Loanda in January or February, 1921 [this *Bulletin*, Vol. 19, p. 368; Vol. 20, pp. 741–742 (MORA)]. Anti-plague vaccination was carried out, and before the second epidemic appeared 12,000 persons were vaccinated. The author states that in houses where plague was present a large number of protected persons escaped infection. The inhabitants offer no objection to anti-plague vaccination.

J. H. T. W.

ANDRUZZI (Alcidiade). **Relazione sulla epidemia di peste bubbonica verificatasi al villaggio "Duca degli Abruzzi" (Novembre 1923–Febbraio 1924).** [An Epidemic of Bubonic Plague at the Village "D.d.A." (Nov., 1923-Feb., 1924).]—*Ann. di Med. Nav. e Colon.* 1924. July-Aug. Year 30. Vol. 2. No. 1–2. pp. 68–82.

This is a detailed, interesting and well written account of an epidemic in Italian Somaliland, its general features and management. Statistics showed that among cases treated with anti-plague serum the mortality was 16·3 per cent.; among cases not treated with the serum the mortality was 85·7 per cent.

J. H. T. W.

SABOLOTNY (D. K.). **[Zum Aufflackern der Pest im Baikalgebiet und in der Mandschurei.]**—*Prophylaktische Medizin* (*russisch*). Charkow. 1923. Year 2. No. 1–2.

TSCHERWENTZOW (A. N.). **[Die Bubonenpest im Baikalgebiet im Verlauf der letzten 10 Jahre.]**—*Ibid.*

SSUKNEW (W. W.). **[Die Pestepidemien des Herbstes 1923 im Baikalgebiet.]** *Ibid.* [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 302.]

These three papers review the outbreaks of plague in the Baikal area from 1911 onward. It is recorded that epidemics, beginning with bubonic plague, developed later into epidemics of pneumonic plague. In almost all instances there existed an epizoötic of plague among tarabagans. The authors also describe the methods used to combat the infection. [Plague in the Baikal and Trans-Baikal area has been frequently noticed in this *Bulletin*; see Vol. 21, p. 71 (ZABOLOTNY); p. 879 (WU-LIEN-TEH); also index.]

J. H. T. W.

TSURUMI (M.). **Recherches sur la peste pulmonaire.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. Nov. Vol. 16. No. 11. pp. 1369–1391.

This very long and detailed report was presented to the Committee by the author, delegate from Japan, at the October session, 1924. He brings together all the observations furnished by the epidemics of pneumonic plague in Manchuria. Most of the aspects dealt with are referred to in separate papers by various authors, and have received notice in this *Bulletin* (see index).

J. H. T. W.

FUJINAMI (Akira). **A Study of the Morbid Histology of the 1921 Manchurian Plague Epidemic.**—*Nat. Med. Jl. China.* 1924. Oct. Vol. 10. No. 5. pp. 287–306.

The descriptions of the morbid histological conditions of the organs and tissues are based upon small specimens from twenty-three cases of pneumonic plague supplied by Dr. WU LIEN-TEH.

The most important tissue changes occur in the lungs and neighbouring bronchial lymph glands; plague bacilli are most abundant, and the tissue changes which take place are mainly due to the presence of these bacilli. The lungs are affected by hyperaemic, serous and cellular exudation, and more or less haemorrhage. The specimens did not, however, reveal specially marked haemorrhage into the alveoli. Fibrin was inconsiderable. Hyaline substance was in most cases found deposited on the alveolar walls. The plague bacilli are abundant not only in the alveoli but also in the interstitial tissue, especially in the lymph vessels and spaces in the neighbourhood of the bronchi and blood vessels, and under the pleura. The lymph vessels at the root of the lung and near the infected bronchial glands are likewise always greatly dilated and filled with bacilli. The multiplication of bacilli in the peribronchial and perivascular lymph vessels is a most important cause of the lobular pneumonia. The spread of pneumonic areas may also be due to inhalation of plague bacilli from the upper and wider parts of the bronchi; the bacilli penetrate from the mucous membrane, whose epithelium is more or less destroyed. The bronchial lymphatic glands are most severely affected. The tissues of the mesenterial glands showed only slight evidence of the presence of plague bacilli and in the cervical glands no large accumulations of bacilli were found. The tonsils are only slightly affected, comparatively small accumulations of bacilli being found, and these mainly in the superficial layer. In nearly all organs bacilli are found in the blood vessels. Next to the lungs and lymph glands they are most numerous in the spleen and liver. [See below (KULESHA).]

J. H. T. W.

KULESHA (G. S.). **On Pathologic Anatomy of Lung Plague. Lesions of Mucous Membrane in the Respiratory Tract during Lung Plague.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 125–130. [5 refs.] With 1 plate. English summary pp. 214–215.

KULESCHA (G. S.). **Beitrag zur pathologischen Anatomie der Lungenpest. Die Erkrankung der Schleimhäute der oberen Luftwege bei Lungenpeste.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1925. Jan. 10. Vol. 254. No. 1. pp. 174–183. With 3 figs. in colour.

Material for the work now recorded was collected and observed during the outbreak of pneumonic plague in Manchuria, Uralsk District, in 1913. Macroscopic examination showed only acute catarrh of the mucous membrane in the larynx, trachea and bronchi; also in the pharnyx and adjacent areas. Microscopic examination, however, disclosed well pronounced and specific alterations: (1) Tonsils (see plate, figs. 1 & 2): appearance of pustules in epithelial layer containing leucocytes and conglomerates of plague bacilli. The subepithelial tissue contained a number of plague bacilli especially around the blood vessels; (2) Trachea and large bronchi: "bocal-shaped" cells of the mucous membrane contained oval bodies that consisted of a mass of *B. pestis* (Pl. fig. 3). In the submucosa there was such an accumulation of microbes that only the blood vessels could be distinguished in the bacterial masses. Two peculiarities are specific: the absence of any sharp reaction of tissues and the penetration of bacilli into the vessels (capillaries and small veins) in the places of bacterial accumulation.

The opinion that infection of the tonsils causes not lung plague, but the appearance of buboes in the neck is unfounded, as in all the cases where the above lesions were found in the tonsils by the author plague buboes were absent. The author states that: "There is an opinion established . . . that introduction of plague infection into the mouth cavity of cats does not bring about pneumonic plague, but causes bubonic plague with lesions of the glands of the neck." During the outbreak a cat was found which had died of lung plague through eating infected flesh from its master's body, driven to such food by starvation (*cf.* this *Bulletin,* Vol. 19, pp. 372–373 (WU LIEN-TEH)].

J. H. T. W.

SHARP (N. A. Dyce). **The Diagnosis of Pneumonic Plague.** [Correspondence.]—*Brit. Med. Jl.* 1924. Dec. 27. p. 1216.

The writer desires a method of establishing the diagnosis between plague complicated with pneumonia and pneumonic plague. The text books give him no satisfaction; but he quotes STITT's opinion: "that plague complicated with pneumonia is the origin of, if not identical with, pneumonic plague." [We agree with STITT. The difference is only that of source and method of infection, and not due to two forms of pathological and clinical pneumonia. Pneumonic plague is evident when it arises in some village or area to which infection has been carried from an epidemic focus; but we must not lose sight of the fact that cases of pneumonic plague occur in the epidemic area together with the septicaemic and bubonic forms.]

J. H. T. W.

AUGAGNEUR. **Une épidémie de peste pulmonaire à Tananarive.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan.-Feb.-Mar.-Apr. Vol. 22. No. 1. pp. 90–100. With 1 fig.

On October 7th, 1923, Dr. VILLETTE, of the Pasteur Institute, reported to the Director of the Sanitary Service that a woman had died of pneumonic plague at the "Maternity." Yersin's bacillus found in the lungs. On the 19th the uncle of the woman died at Ankadidanibe about 12 kilometres from Antananarivo. Relatives journeyed to Antananarivo to be present at the funeral, and, as is the custom, remained several days with the family of the deceased. It further transpired that Ramavo, daughter of the woman mentioned above, had died on September 26th, after a few days of illness. After the funeral of this girl a relative died on October 2nd of pneumonia; but no plague bacilli were found on puncture of the liver. There were, therefore, several foci from which infection might spread, and did spread, as is well shown in a diagram.

There were 27 cases; all died. Twenty-two gave positive results for *B. pestis*; 5 examinations gave negative results. The author points out the extreme importance of following out the tracks of any possible infection, and the absolute necessity of isolating every person who has been in contact with a case of plague.

J. H. T. W.

NICOLLE (Charles) & GOBERT (E.). **Considérations générales sur la peste pulmonaire et sur sa nature à propos de quelques petits foyers de cette forme de peste observés en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 212–225. [14 refs.]

The small outbreaks do not differ in any important particular from those elsewhere recorded. The source of infection was traced in some of the epidemics, but not in all of them. In some instances rats were found suffering from plague, in others there was no sign of an epizootic among rats. The authors state as a theory that pulmonary plague is a secondary infection by plague bacilli during influenza. As a primary condition in this conception there must exist healthy human carriers of *B. pestis* [*v.* this *Bulletin*, Vol. 21, p. 878 (LEGER & BAURY)]. The authors write:—

There is no doubt that two distinct forms of plague exist without evident relation to one another.

1. *Bubonic plague* passing generally from the rat [or other rodent] to man, and rarely from man to man, and not accompanied by pneumonia except occasionally as a secondary complication.

2. *Pneumonic plague*, in which the attack starts in the lungs, and which is generally fatal; it is not accompanied with buboes, and is not related to rat-plague [?], and is strongly contagious from man to man.

F. Norman WHITE (*Rapport soumis au Comité d'Hygiène de la Société des Nations.* Geneva, 1924)* has put forward the hypothesis that this pulmonary plague is due to the association of an unknown microbe, not pathogenic for rats, with the bacillus of plague. We adopt this conception, and we regard the influenza virus as the agent in this association.

J. H. T. W.

URIARTE (Léopold). **Persistance du bacille de la peste dans l'organisme infecté.**—*C.R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1039–1040.

"Some time ago I had the opportunity of observing a case of plague. It was bubonic plague, and presented, as a rare complication, iridocyclitis in one eye, with abundant hypopyon. With serum treatment the case progressed favourably, symptoms disappeared, and the patient was considered to be cured The ganglionic infarct was reduced as also the ocular lesion, but with loss of vision. However, three weeks later the patient died suddenly. At the autopsy the cerebral meninges were found congested, and showed several yellow granules the size of a pin's head. Examined microscopically these were found to consist of globules of pus containing *B. pestis*; the bacilli were also found in the ocular lesion. These bacilli were virulent; inoculated into guineapigs they caused death with the recognized lesions."

J. H. T. W.

URIARTE (L.). & GONZALEZ (S.). **Infection pesteuse chez un Rongeur sauvage.**—*C.R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1040–1041.

The authors report that in the Argentine they have found the "Cuis," *Cavia aperea*, infected with plague. Several times the epizoötics have coincided with the appearance of cases of human plague.

J. H. T. W.

NIKANOROV (S.). **Sur le traitement de la peste bubonique et pulmonaire par le vaccin antipesteux glycériné.**—*Rev. Microbiol. et Épidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 182–185. French summary pp. 224–225. [2 refs.]

The detailed histories of the patients are to be found in the Russian text.

Cases of cure of pneumonic plague are rare, and even in bubonic plague on the Russian steppes the mortality is 50 to 80 per cent. Convalescence of bubonic plague is always extremely slow, and the cicatrization of open and suppurating buboes long drawn out. If the buboes are not open reduction takes even a longer time. In 1923 the author treated plague with anti-plague vaccine in physiological saline. The results were not encouraging.

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* See *Sanitation Supplements.* 1924. pp. 182–7.

In 1924, influenced by M. BERNARD's method of preparing an anti-staphylococcus vaccine, the author prepared his vaccine. Cultures of *B. pestis* on agar, incubated for 48 hours, were stirred in saline, and the mixed dilution centrifuged, washed three times in the centrifuge, and the clot diluted with 50·0 cc. of glycerine, sterilized and placed in the ice-chest. All the germs were dead at the end of 1 to 3 months. At the end of this period control experiments were undertaken to ensure sterility, after which sufficient physiological saline was added to give 100 million germs per cc. of vaccine. The vaccine was given subcutaneously, daily or every second day, in doses of 0·5 to 1·15 cc., until the patient died or recovered. Seventeen cases of bubonic plague were treated; 14 recovered (mortality 20 per cent.). Doses of the vaccine also hastened the reduction of buboes and lessened the suppuration of open buboes. Two of the cases of bubonic plague were complicated by pneumonia; one of these was saved by treatment with the vaccine.

In primary pneumonic plague the author noticed improvement and fall of temperature, but no cures resulted.

J. H. T. W.

MARSHALL (Claude H.) & RAM (Achhru). **The Treatment of Plague in Uganda.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 207–209. [2 refs.]

Uganda Protectorate is rarely free from sporadic cases of plague, while from time to time an epidemic occurs. The question of treatment has offered great difficulties. In 1917 one of the authors (A. R.) treated 103 cases by intravenous injections of iodine, but only 16 of these recovered. In 1920, during an outbreak of plague in the Indian Bazaar, Kampala, Dr. C. J. BAKER treated 50 cases with iodine intravenously; 19 recovered, 31 died. Tincture of iodine was given orally (see this *Bulletin*, Vol. 19, pp. 368–369). The authors refer to treatment with neokharsivan, *loc. cit.*, p. 732 (MANSOOR); Vol. 21, pp. 67–68 (MARSHALL & RAM). During 1923 the authors continued to treat plague by intravenous injections of arsenical preparations:—

	Total.	*Cured.*	*Died.*
Pneumonic	2	0	2
Septicaemic	2	2	0
Bubonic (advanced cases)	11	2	9
„ (early „)	11	8	3
Septicaemic and bubonic...	1	1	0
	27	13	14

[See this *Bulletin*, Vol. 21, p. 67 (NEILSON); p. 884 (PAL). No mention is made of treatment with anti-plague serum.]

J. H. T. W.

BALFOUR (Andrew). **The Treatment of Plague: A Suggestion.** [Correspondence.]—*Brit. Med. Jl.* 1924. Dec. 6. p. 1081.

The writer draws attention to the urgent necessity of finding a remedy for plague. Anti-plague serum, useful if given early in large doses, is not always reliable. Most drugs are useless ; tincture of iodine and novarsenobillon administered intravenously appear to be the best. Dr. Balfour recommends a trial of " mercurochrome 220 soluble " given with success in enteric and puerperal fevers. In both bacteriaemia is present as in plague. It has been used, as recorded by GREELEY, in Rocky Mountain fever with good results.

Occasionally when given intravenously mercurochrome causes a severe reaction, but as a rule the reaction is moderate and the drug can be administered with safety. Any risk of ptyalism can be combated by a mouth-wash of turpentine used alternatively with hydrogen peroxide. As to dose, YOUNG and HILL state that for intravenous injection in puerperal sepsis and acute gonorrhoea, a 1 per cent. solution in water may be employed and from 2 to 5 mgm. per kilo of body weight given. GREELEY gave doses of 20·0 cc. of a 1 per cent. solution, and in typhoid fever BOND and BARRIER found 15·0 cc. per 100 lb. of body weight an average effective dose ; in plague 20·0 cc. might be used in severe cases. Mercurochrome is dibromo-oxy-mercury-fluorescein, or its sodium salt, $C_{20}H_7O_5Br_2HgOHNa_2$.

J. H. T. W.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1923.** [MACKIE (F. P.), Offg. Director.]—49 pp. With 3 charts. 1924. Bombay : Govt. Central Press. [Price As. 14 Ps. 6.]

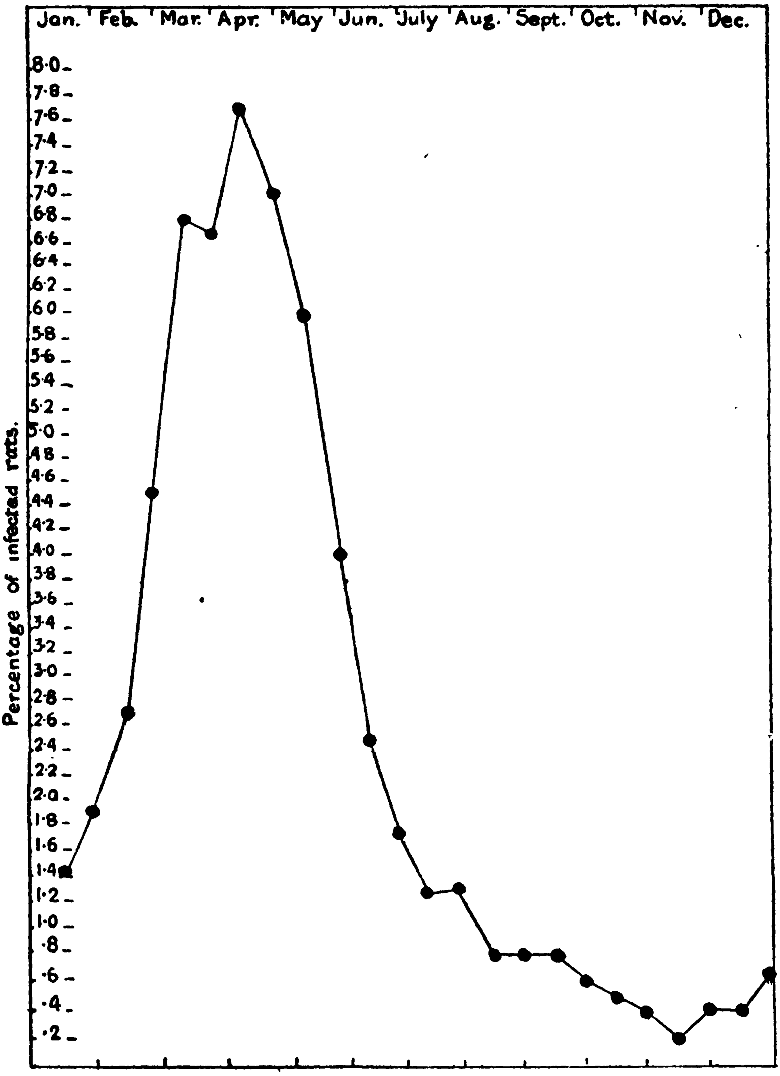
This Report is arranged on the same lines as in previous years. The output in doses of anti-plague vaccine for 1923 and for the previous four years is given. For 1923 the number was : 1,298,415. Many rats were received for examination. Of those dead when received, 305,343 were examined, and 8,476 were found to be infected with plague. An interesting chart is reproduced (see over) showing the percentage of plague-infected rats at different seasons of the year.

The comparative experiments on transmission of plague by *X. cheopis* and *X. astia* have already received notice ; this *Bulletin*, Vol. 21, p. 440 (TAYLOR & CHITRE). There is (pp. 21–22) a note by Major J. TAYLOR, I.M.S., and Assistant Surgeon G. D. CHITRE on an electric rat-guard for ships' hawsers. Their conclusions were :—

> " The three series of tests show that the rat-guard described provides, under strict conditions of test, a complete obstruction to the passage of rats along cables when used with an alternating current of 230 volts. With a direct current of 110 volts (the current usually available on ships) full protection is not obtained. A 230-volt alternating current will usually be available in ports such as Bombay, and if connected to a guard of this type will prevent any traffic of rats between the shore and ships along the hawsers."

On page 28 there is brief note on Haffkine's Plague Prophylactic and its constituent parts. It is concerned with the two parts of the vaccines : the supernatant fluid and the sediment. The conclusions drawn are :—

> " 1. The whole prophylactic given in a dose of 0·5 cc. killed 35 per cent. of rats from toxaemia and produced an immunity which reduced the mortality among infected rats from 95·3 per cent. to 55·6 per cent.
>
> " 2. The supernatant fluid is less toxic (19·8 per cent.) than the whole prophylactic, and is as efficacious in producing immunity as the whole prophylactic (53·1 per cent.).



The percentage of plague-infected rats at different seasons of the year in Bombay City in 1923.

[Reproduced from the *Report of the Bombay Bacteriological Laboratory for the Year 1923.*]

"3. The sediment, in the doses employed, has little or no toxic properties, and little or no immunizing properties for rats" [*v.* this *Bulletin*, Vol. 21, p. 882 (STEVENSON & KAPADIA)].

On page 29 there is a section dealing with oral vaccination of rats and guineapigs. The experiments with rats failed: they refused to eat food containing bile, and when fed with a catheter, most died of oedema of the glottis. Survivors died of plague within 10 days of infection with "test virus." As to guineapigs, oral administration of the vaccine, with or without bile, affords no protection against subsequent infection.

J. H. T. W.

i. MORISON (J.), NAIDU (B. P. B.) & AVARI (C. R.). **The Production of Immunity against Plague by Vaccine. I. Haffkine's Plague Prophylactic. II. Agar Cultures. III. Immunisation by Oral Administration of Plague Vaccine with and without Bile.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 313–320. [11 refs.]; pp. 321–326. [1 ref.]; pp. 327–330.

ii. MACKIE (F. P.). **Commentary on the Foregoing Papers on the Production of Immunity against Plague by Vaccine.**—*Ibid.* pp. 331–332.

i. I and III already noticed under Bombay Bacteriological Laboratory (see above).

II. "When compared with 0·5 cc. of Haffkine's prophylactic, agar cultures treated with formalin and acetone are not toxic and show no evidence of immunizing power, even in doses of 12·5 milligrams. Agar cultures treated with chloroform vapour and 1 per cent. carbolic acid show no immunizing power until the weight of dried vaccine exceeds 13·6 mgm. Agar cultures treated with 1 per cent. carbolic acid possess immunizing properties when used in a dose of 8 mgm. Agar cultures heated at 60° C. for 15 minutes and then carbolized to contain 0·5 per cent. carbolic acid possess immunizing value with doses of 4 mgm. and upwards. Only with heated vaccine does the toxicity regularly increase with the dose."

ii. The writer notes that it is not by any means certain that the toxicity test on rats as used by the investigators is identical with or bears any relation to the reaction brought about in the human tissues at the site of inoculation. He further states that the attempts to improve Haffkine's vaccine on the lines indicated in the foregoing papers have not given results justifying any important modification in the present methods of manufacture.

J. H. T. W.

GIRARD (G.) & QUIMAUD (J.). **Essai d'immunisation antipesteuse par cutivaccination chez le cobaye.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 471–475. [2 refs.]

These experiments are said to confirm the impossibility of rendering guineapigs immune by means of heated anti-plague vaccines. The vaccines used were the aqueous vaccine of the Pasteur Institute, Paris, and the lipo-vaccine of LE MOIGNIC [see this *Bulletin*, Vol. 12, p. 361]. Excluding the guineapigs that died during the experiments, there remained nine animals subcutaneously vaccinated, of which two died after a virulent inoculation of plague. The action of the vaccine, though feeble, is not in doubt. Of 9 animals cutaneously vaccinated by scarification 7 died of septicaemic plague, as did the controls. The authors conclude that: "This latter technique does not offer any advantage over the former; it is, rather, inferior to it."

J. H. T. W.

DI MATTEI (Eugenio). **Il reperto anatomico dell' infezione pestosa dei murini come contributo alla diagnosi e alla epidemiologia della peste.** [Morbid Anatomy of Plague Infection of Rats, Contribution to Diagnosis and Epidemiology.]—*Ann. d'Igiene.* 1924. Nov. Vol. 34. No. 11. pp. 781–795. [17 refs.]

Beginning with a reference to the *Report on Plague Investigations in India*, the author gives numerous references to work done by other investigators. *M. decumanus* and *M. rattus* were used in his experiments, and the animals were infected by different methods, each organ being carefully examined after death. The morbid anatomy of rodents dying of natural or experimental plague has often been described and the author's paper gives us nothing that is new. The bacteriology is, of course, also described.

J. H. T. W.

OHOTO (Osamu). ***B. pestis* in Blood, Bile and Urine.**—*Jl. Infect. Dis.* 1924. Sept. Vol. 35. No. 3. pp. 291–294. [3 refs.]

In whatever way *B. pestis* was inoculated it entered the circulating blood in all the animals. Of 6 samples of urine 5 contained *B. pestis.* On cultivation, bile in 6 of 9 cases gave growth of bacilli. In view of these observations plague apparently develops in much the same manner that typhoid fever does. The invasion of bacilli into the blood may occur earlier than generally recognized, and they may grow not only in tissues but also in the blood itself. That bacilli pass out in the bile and urine seems quite probable [*v.* this *Bulletin*, Vol. 21, p. 69 (OHOTO)].

J. H. T. W.

URIARTE (L.) & MORALES VILLAZON (N.). **Procédé de culture pour différencier le bacille de la peste.**—*C. R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1041–1043.

The authors use a culture medium prepared as follows :—

Water 1,000 gm., peptone 20 gm., rendered slightly alkaline. If necessary it is precipitated and filtered. Then add 8 gm. of glucose or laevulose, and 4 to 6 cc. of a 1 per cent. solution of neutral red. Place 8 to 10 cc. in ordinary culture tubes and in each of these tubes place a little tube 45 mm. long and 10 mm. in diameter with the opening directed downwards as a fermentation tube. Sterilize at 110°, which also drives all air out of the tubes. The medium has an orange-red colour, and *B. pestis* grows well in it, showing the following characters : (1) 20 to 48 hours after inoculation the colour changes to "solferino" diminishing in intensity after 3 or 4 days ; (2) no gas is produced ; (3) throughout the column of liquid growth occurs in little floccules resting against the surface of the large tube or the outer surface of the small tube ; otherwise the liquid remains clear. If these three conditions do not exist together the culture is impure.

J. H. T. W.

Comptes Rendus du 4-ième Congrès antipesteux organisé à Saratov par l'Institut de microbiologie et d'épidémiologie d'état du Sud-Est de la Russie de 19 à 23 mars de 1924.—201 pp. With 1 map. 3 plates & 3 figs. [In Russian. Resolutions translated into French pp. 145–152.]

While these Resolutions show knowledge of the existing conditions and an ardent desire to carry out any work that can help in the abolition or treatment of plague, be the work done in the laboratory or in the field, they add nothing to our knowledge of plague.

J. H. T. W.

IGLESIAS (M. S.). **[Extinction of Foci of Plague.]**—*Gac. Méd. de Mexico.* 1923. Dec. Vol. 55, p. 713. [Summarized in *Jl. Amer. Med. Assoc.* 1924. June 7. Vol. 82. No. 23. p. 1901.]

The author declares that no instance is known of plague having been conveyed by land traffic in bales or other goods containing rats. Rats will not stay in freight that is handled much and jolted. [It would not be safe to accept this as absolute. Even if infected rats fled from the bales on movement infected fleas and bacilli might remain dangerous for a few days. [See this *Bulletin*, Vol. 18, p. 345 (FLU); Vol. 20, p. 360 (SWELLENGREBEL).]

J. H. T. W.

ZEISS (H.). **Weitere Untersuchungen ueber die Einwirkung von Yatren auf Pestbakterien.** [Action of Yatren on Plague Bacillus.]—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 147–149. [5 refs.] German summary pp. 219–220. [1 ref.]

For the earlier work see this *Bulletin*, Vol. 21, p. 883. In the present investigation animals were inoculated; the results were not uniform, and are not very convincing.

J. H. T. W.

MANTEUFEL (P.). **Neuere Ergebnisse der Pestepidemiologie.** [Recent Findings in Plague Epidemiology.]—*Seuchenbekämpfung.* 1925. Vol. 2. No. 1/2. pp. 33–36.

Readers of this *Bulletin* will not find anything new in Dr. Manteufel's paper. He mentions a recent theory put forward by Norman WHITE and supported by NICOLLE and GOBERT [see above, p. 376]; but he is careful to remark that the theory has still to stand the test of criticism.

J. H. T. W.

LEGER (Marcel). **Considérations sur l'épidemiologie de la peste. L'homme peut, comme le rat, être un réservoir de virus.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 309–313. [4 refs.]

The facts upon which this paper is based will be found in this *Bulletin*, Vol. 21, p. 878 (LEGER & BAURY.)

J. H. T. W

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. Trans. Fifth Biennial Congress, Singapore, 1923. pp. 286–351. **VI.—Plague.** [WU LIEN TEH, TSURUMI (M.) & VERVOORT (H.).]

FARRER (E. M.). **Clinical Notes on Plague.**—*Jl. Assoc. Med. Women in India.* 1924. Aug. Vol. 12. No. 3. pp. 11-15.

FUJINAMI (Akira) & WU LIEN TEH. **Morbid Histology of Pneumonic Plague.**—*China Med. Jl.* 1924. Aug. Vol. 38. No. 8. pp. 617–626.

GIRARD (G.). **Sur la virulence de la peste murine à Tananarive.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 525–528. [2 refs.]

GOBERT & CONSEIL. **[Sur quelques cas de peste constatés à Tunis en 1922.]**—*Rev. Tunisienne des Sciences Médicales et Tunis-Médical.* 1923. Feb. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1924. Apr. Vol. 16. No. 4. pp. 475–476.]

GOTO (Osamu). **[Studies on** *Bacillus pestis.* **II.- Communication. On the Appearance of the Plague Bacillus in the Blood, Bile and Urine.]**—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1923. July. Vol. 22. No. 7. [Summarized in *Japan Med. World.* Tokyo. 1924. Jan. 15. Vol. 4. No. 1. p. 15.]

GRAHAM (J. D.). **Notes épidémiologiques sur la peste dans l'Inde Britannique au cours des dernières années.** [Extracts.]—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 581–586.

HANNA (W.). **The Fumigation of Vessels as an Anti-Plague Measure.**—*Jl. Roy. Sanitary Institute.* 1924. Jan. Vol. 44. No. 8. pp. 280–288.

JIMENEZ (J.). **Observation d'une épidémie de peste dans le port de Malaga (juin-septembre 1923).**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 20–23.

JOANNIDÈS (Georges Sp.). **Considérations sur les dernières épidémies de peste à Messène (Nissi) et à Syra.**—*Grèce Méd.* 1925. Jan.-Feb. Vol. 27. No. 1–2. pp. 3-5. [1 ref.]

JORGE (Ricardo). **Rémarques à propos de la peste.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 592–595.

MITCHELL (Alexandre). **Les épidémies de peste dans l'Union de l'Afrique du Sud.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 566–571. With 1 map in text.
[*v.* this *Bulletin*, Vol. 19, p. 366 (HAYDON).]

NIKANOROV (S.). **L'épidémie de peste dans le village Kitchkino l'arrondissement des Kalmouks, au juin-août 1923.** [Abstract.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. pp. 104–106. [In Russian pp. 55–63.]

——. **La peste et la lutte contre elle au Sud-Est de la Russie.—Communication à la Conférence internationale sur le paludisme organisée par le Comité d'Hygiène de la Société des Nations.**— 3 pp. With 1 map & 2 charts. 1924. Saratov.

DE PENNING (H. C.). **The Diagnosis of Pneumonic Plague.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 14. p. 532.

PETRIE (G. F.). **A Commentary on Recent Plague Investigations in Transbaikalia and Southern Russia.**—*Jl. of Hyg.* 1924. July. Vol. 22. No. 4. pp. 397–401. [14 refs.]

REES (D. C.) & MITCHELL (J. A.) **Plague: A Brief Account of its Symptoms, Clinical Diagnosis, Morbid Anatomy, and Treatment.**—*Med. Jl. S Africa.* 1924. June. Vol. 19. No. 11. pp. 350–355.

SHUKEVICH (J.) & KLINOV (V.). **Outbreak of Plague at Trapezund in 1917.** [Abstract.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1924. Vol. 3. No. 4. p. 307. [In Russian pp. 259–270.]

TSURUMI (Mitsuso). **Note préliminaire sur la peste en Extreme-Orient.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 587–588.

CORRESPONDENCE.

CLEMOW (F. G.). **Plague and the Tarabagan** [Correspondence].—*Lancet.* 1924. Sept. 6. p. 526.

With reference to the note on Dr. Clemow's letter which was published in this *Bulletin* (Vol. 21, p. 879), Dr. J. W. H. CHUN, Acting Director and C.M.O. of the North Manchurian Plague Prevention Service, writes from Harbin to correct the statement that Dr. WU LIEN-YEH has not given credit to the Russians who wrote between 1881 and 1911 on this subject. The Russian observations are summarized by Dr. WU, he states, in the 4th volume of Reports of the North Manchurian Plague Prevention Service in his article. "Plague in the Wild Rodents, including the Latest Investigations into the Rôle played by the Tarabagan."

Little of the early work, however, is mentioned here. For this another article, "The Original Home of Plague" (pp. 178–98), should be consulted, or better still, Dr. CLEMOW's "Plague in Siberia and Mongolia and the Tarabagan." *Jl. Trop. Med. & Hyg.* 1900. p. 169.—Editor.

CHOLERA.

BARIKIN (W.) & ZACHAROFF (A.). **Die Epidemiologie der gegenwärtigen Cholera in Russland.** [Epidemiology of Cholera in Russia.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. July 15. Vol. 92. No. 3/4. pp. 201–208.

The authors describe the epidemiology of cholera epidemics during the last few years. These outbreaks displayed the usual characters, here and there generally endemic, in some places (*e.g.*, Rostow) showing summer and autumn maxima with exacerbations in the spring. In 1921-1922 the famine, which compelled the peasants to eat the bark of trees, clay, etc., rendered them easy victims to cholera infection.

J. H. Tull Walsh.

CHATTERJEE (Sachindra Nath). **Notes on a Few Cases of Cholera treated by Various Methods of Treatment.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 554–557.

The methods of treatment compared were :—

(1) The essential oils mixture ; (2) essential oils and permanganate of potassium ; (3) kaolin, alone, and with the permanganate ; (4) " Rogers Treatment."

The numbers treated were small, 5 or 6 in each section, and no really definite opinion is possible. The author is of opinion that :—

" The intravenous injection is a long procedure and cannot be repeated in village practice. It is, however, found that rectal injection of tepid normal saline every 2 to 4 hours according to the urgency of the case, with permanganate pills, sometimes are of more service, but it is also not as practicable as kaolin and permanganate in village use where the majority of the people are illiterate, and also it is almost impossible in the case of female patients. But further experiment is necessary before coming to a final decision that *kaolin and permanganate is the best and easiest method of treating cases of cholera in village practice.*"

J. H. T. W.

MINERVIN (S.). **Eine Selektionsmethode für den Choleravibrio.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Nov. 15. Vol. 93. No. 5. pp. 334–340.

From plate cultures of *V. cholerae* the author takes separate colonies and tests their agglutinating reaction. Colonies with low agglutinating power are sown on agar slopes and again in Petri dishes, The vibrios can be classed according to agglutinating power. This method of selecting individual colonies shows different grades of agglutination down to its absence. The presence of such vibrios as those giving no reaction, if occurring in natural conditions, would make diagnosis of cholera sometimes difficult.

J. H. T. W.

NOBECHI (Keizo). **Contributions to the Knowledge of** *Vibrio cholerae.* **1. Studies upon Immotile Strains of** *Vibrio cholerae.* **2. Fermentation of Carbohydrates and Polyatomic Alcohols by** *Vibrio cholerae.* **3. Immunological Studies upon the Types of** *Vibrio cholerae.*—*Scientific Reports from Govt. Inst. for Infect. Diseases.* Tokyo. 1923. Vol. 2, pp. 1–87. [93 refs.]

These papers contain accounts of laboratory and experimental work. Here and there the author claims a new method or a new result. Conclusions :—

1. The author found two immotile strains among 88 stock cultures from various sources and of various ages. Except for loss of motility, they reveal typical features : morphological, cultural, biological and immunological. Their pathogenicity for guineapigs is the same as that of normal motile strains. Their immotility is due to absence of flagellum. The immotility was inherited for thirty months ; there was no reversion. The author classifies them as :—

{*Microspira comma* Schröter var. *immobilis* Nobechi (1923).
{*Vibrio cholerae* Buchner ,, ,, ,, ,,

2. Twenty-one selected strains of *V. cholerae* attacked in the same manner twelve carbohydrates, four polyatomic alcohols and one glycoside. [*v.* this *Bulletin*, Vol. 21, p. 449 (SUHATZEANOU & THÉODORASCO).]

3. A new immunological type of cholera strains, placed between KABESHIMA's " original " and " varied " types, was discovered, and is called the " middle type."

> " All middle type strains are agglutinated by the sera of the two other types, capable to differentiate the strains of the two types from each other, to the same titre with corresponding strains ; and the middle type sera, with no exception, agglutinate all strains of the other types as well of the middle type almost uniformly high. From the result of the agglutinin absorption test, the middle type strains studied by the author are assumed to be provided with the common antigene X, and the original type specific A, at the same time also with the varied type specific B, though the development of the last is incomplete."

The " middle " type is not a mixture of the other two, but a definite type. All three types—" original," " middle," and varied "—were constant in growth on routine agar media during the year and a-half that the " middle " type was tested. The author states that in 1921 four cases from Shanghai gave the " middle " type, and that during the 1922 epidemic " all strains collected from various districts and from different stages of the epidemic were proven to be attributable to the middle type."

J. H. T. W.

i. GRATIA (André) & RHODES (Bernice). **Production d'anticorps bactériolytiques et hémolytiques par la voie cutanée.**—*C.R. Soc. Biol.* 1924. Oct. 7. Vol. 91. No. 28. pp. 797–798. [2 refs.]

ii. CIUCA (M.) & BALTEANU (I.). **A propos de la note de A. Gratia et B. Rhodes.**—*Ibid.* Dec. 5. No. 34. pp. 1228–1229. [2 refs.]

i. The authors' work is a mere repetition of experiments recorded by CIUCA and BALTEANU [this *Bulletin*, Vol. 21, p. 448] with different conclusions. They find that guineapigs, protected by cutaneous vaccination with friction of the skin, are just as well protected against infection as those receiving intra-peritoneal vaccination. Also, they consider that the serum of guineapigs after "cuti-vaccination" possesses a protective power equal to the serum of those vaccinated by the peritoneal route.

ii. Ciuca and Balteanu do not admit that the serum of guineapigs after cuti-vaccination contains any antibody and their results showed that such serum had no prophylactic properties. They admit that guineapigs resist infection after cuti-vaccination ; but they deny that antibodies are produced in the blood.

J. H. T. W.

PICAZIO (A.). **Sulla ricerca dei vibrioni delle acque.**—*Riforma Med.* 1924. Dec. 1. Vol. 40. No. 48. pp. 1133–1136. [10 refs.]

Mainly a résumé of work recorded, by previous investigators, into the nature and properties of vibrios found in water, including the cholera vibrio and those similar to it. In his own experiments the author describes the growth of vibrios in alkaline peptone water and on the Endo and Dieudonné media, agglutination results and methods of diagnosis. The list of references is full and useful.

J. H. T. W.

GOLOVANOFF (M.). **Contribution à l'étude de l'anti-virus cholérique.**—*C.R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30. pp. 929-930. [1 ref.]

The author records further experiments with cholera "anti-virus" [Bacteriophage]. The animals used were rabbits and the object of the work was to find out if injection of "anti-virus" led to the formation of antibodies. Control experiments were made with vibrio vaccine. The author concludes that "only the bodies of cholera vibrios give rise to antibodies ; filtered cultures do not although they confer protection." [*v.* this *Bulletin*, Vol. 21, pp. 447–448 (BESREDKA & GOLOVANOFF).]

J. H. T. W.

GOLOVANOFF (M.). **Sur la spécificité de l'antivirus cholérique.**—*C.R. Soc. Biol.* 1924. Dec. 27. Vol. 91. No. 37. pp. 1379–1381.

The author records experiments tending to prove that the protecting properties of the antivirus, obtained as a filtrate from cultures of *V. cholerae*, are specific—at any rate, for guineapigs. He writes : "Since the antivirus, issue of the bodies of the vibrios, could not act otherwise than the vibrios themselves, the immunity created by the latter after vaccination ought to be effected equally without antibodies." [It does not follow that the antivirus is the same in composition and properties as the protein of the bacillus forming the usual "vaccine." The antivirus, or, as some workers call it, the "bacteriophage" is evidently an excretion, or possibly only a refuse product of metabolism, poisonous for the *V. cholerae*. Many such poisons are found in the excreta and metabolic refuse in plants and in animals.] The author prepared filtrates from cultures of the pyocyanic bacillus, *B. proteus* and *B. prodigiosus*. Guineapigs injected with these filtrates did not survive, except in a few cases, inoculation of a lethal dose of *V. cholerae* given 24 hours later. The controls protected with *V. cholerae* filtrate lived after similar treatment.

J. H. T. W.

KEPINOW (Léon). **Immunité non spécifique et fugace. Action immunisante des filtrats bactériens spécifiques, et non spécifiques, sur l'infection cholérique.**—*C.R. Soc. Biol.* 1924. Dec. 27. Vol. 91. No. 37. pp. 1374–1376. [1 ref.]

The views of this author and the results recorded are a direct contradiction of those noticed in the paper by GOLOVANOFF—see above [see this *Bulletin*, Vol. 21, p. 888].

J. H. T. W.

PRATT (W. W.). **An Examination of Twenty Strains of Vibrio isolated from Cholera Cases.**—*Jl. Roy. Army Med. Corps.* 1925. Jan. Vol. 44. No. 1. pp. 40–45. [7 refs.]

This work was undertaken with a view to establishing the serological identity of a number of strains. The twenty strains, which came from Calcutta, Constantinople, Mysore, etc., are enumerated, with tabulated reactions (3 Tables). All the vibrios examined agree in the following particulars :—

(1) They are non-haemolytic.

(2) They have one terminal flagellum.

(3) They have similar biochemical reactions as far as these were examined. They all liquefied gelatin, and gave the cholera-red reaction.

There appear to be two serological groups. These types may or may not be distinguishable by agglutination tests only, according to the serum used. They can be distinctly defined by absorption tests. This work emphasizes the importance of using a suitable antigen for preparing agglutinating serum. If only one serum be used for diagnostic purposes it must have the property of agglutinating all strains.

J. H. T. W.

BRUTSAERT (Paul). **La constitution antigénique des vibrions du choléra.**—*C.R. Soc. Biol.* 1924. Nov. 28. Vol. 91. No. 33. pp. 1157-1159. [6 refs.]

As the result of these experiments in which rabbits were injected with emulsions of *V. cholerae* (1) simply killed by heat at 56° C. and (2) heated at 100° C. for two hours, the author states : " Our anti-cholera vibrio serums obtained by injection of Koch's vibrios heated during two hours at 100°, agglutinated our different strains of cholera vibrios, whether they were heated to 100° or not, quite as well as anti-serums of 56° prepared at the same time. As absorption trials confirmed the agglutination experiments, we state that all their antigen is thermostable."

J. H. T. W.

FUJII (S.). **Findings of an Experimental Study of the Kidney affected by Cholera Toxin.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 209–227. With 1 plate. [29 refs.]

The plates show the condition of the kidney 12 hours and 7 days after injection of cholera bacilli emulsion. The details of the various experiments cannot be condensed, but we give the author's "Conclusions":—

There is no theory that can satisfactorily explain the anuria in cholera. Theories are based on postmortem observations without supplementing the facts by experimental pathology. In my experiments the cholera toxin early brings forth . . . nephrosis of the urinary canaliculi, and then causes glomerular nephritis . . . The granular degeneration of the tubuli contorti is seen very early and reaches its height 8 to 24 hours after injection, when the interior of the canaliculi become almost obliterated. The kidney gradually becomes anaemic and finally bloodless. Turbidity and swelling then decreases by degrees. The cellular protoplasm turns into a granular substance, which is well stained with eosin, and serous substance. They stay in the shape of drops in the tubuli contorti. Later on they are discharged into the tube while the height of the cells decreases and the urinary canal becomes wide. Then the blood in the kidney either becomes normal again or it is in a state of congestion or haemorrhage.

J. H. T. W.

Acton (Hugh W.) & Chopra (R. N.). **The Nature and Pharmacological Action of Cholera Toxin.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 235–249. With 10 graphs. [4 refs.]

The details of investigation in this paper cannot be satisfactorily condensed; but the results obtained are fully shown in the "Conclusions":—

The cholera vibrio, as we know, can liquefy gelatine, and reduce the amino-acid trytophane to indol. We now show that it can also decarboxylate amino-acids into poisonous bases.

The protein bases found in a 10-days cholera broth culture consist of two main fractions, volatile and non-volatile bases. The volatile bases are almost devoid of pharmacological activity on the tissues tested, but they cause a tonic contraction of the rabbit's intestine.

The non-volatile bases contain the poisonous toxins, which depress blood pressure, etc. These poisonous bodies are found in the arginine fraction of the non-volatile amino-acids, so that they only form a small proportion of the non-volatile bases. The main actions of these toxic bases are: (1) A fall of blood pressure due to vasodilatation of the vessels supplying the small intestines, combined with an increased permeability of the vessel endothelium; (2) direct action on the secreting tubules of the kidney which are further hampered by the occurrence of an intertubular oedema as soon as the blood pressure rises to normal; (3) an oxytocic action on the pregnant uterus, causing miscarriages.

The optimum conditions for the production of these bases are the necessary amino-acids, pH on the alkaline side, and a liberal supply of oxygen.

J. H. T. W.

van Loghem (J. J.). **Exo-haemolysine en endo-haemolysine bij vibrio Tor en vibrio cholerae.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 9. 68th Year. 2nd Half. No. 6. pp. 773–776. [5 refs.]

Concerning the action of bacteria on blood, a distinction is made between haemodigestion, *i.e.*, digestion of the components of the blood and haemolysis, *i.e.*, the expulsion of haemoglobin from the erythrocytes. Erythrocytes of goat's blood are not haemolysed by *Vibrio cholerae* within 24 hours; they are by V. "El Tor," likewise by *V. cholerae* within a period exceeding 24 hours, but the clear zone surrounding the colonies in solid media has been shown no longer to contain oxyhaemoglobin (as is the case around colonies of V. El Tor) indicating that not haemolysis but haemodigestion has set in.

N. H. Swellengrebel.

PEVERELLI (P.). **De vaccinatie tegen cholera langs den weg van het darmkanaal.** [Vaccination against Cholera by the Way of the Intestine.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 2. 68th Year. 2nd Half. No. 5. pp. 638-640.

Confirmation of BESREDKA's observations that normal rabbits are insensitive to large doses of living or killed cholera-vibrios in their intestinal canal, but that various antibodies appear in their blood serum (agglutinins, bacteriolysins and bodies fixing complement) if bile (of oxen) is given before the bacterial dose. The dose in this case produces an often fatal enteritis. The post-mortem findings show a strong hyperaemia, notably of jejunum and ileum, the contents of which are fluid, often bloody, and the vibrio is found in the gut, and often in the gall-bladder. The bactericidal action of the gutwall is not found in the sterile fluid expressed from its tissue. Rabbits vaccinated in this way were usually resistant to an intravenous dosis of vibrios, fatal to untreated rabbits. Some of them, however, died sooner than the control-animals; whether this is to be regarded as a phenomenon of anaphylaxis, or caused by liberation of an excess of endotoxins, remains undecided.

Vaccination of two sets of 7 men, the one set receiving a tabloid containing 200 milligrams of desiccated bile together with one containing desiccated cholera-vibrios on three succeeding mornings before breakfast, the other set receiving no bile, showed that all of the first and one person of the second set had produced agglutinins, indicating resorption of the vaccine, for which the addition of the bile is, consequently, not absolutely indispensable.

N. H. Swellengrebel.

OYAMA (Ryo). **[A Comparative Study on the Production of Anti-Bodies by *Vibrio cholerae* having Different Magnitudes of Virulency.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. May. No. 338. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 300.]

In the present experiments with cholera vibrios the author found that under similar conditions there occurred no differences in the amount of antibodies produced by different strains of vibrios having different virulency. The amount was exclusively determined by the bacterial body itself. Their biological characters had no concern with the production of such divergent amounts of the antibodies. The efficacy of the antibody production by a given strain should be determined by the estimation of the produced antibodies in the serum immunized with that special strain of the vibrio.]

J. H. T. W.

SATOMI (Mitsuwo) & HIRAKAWA (Hiroshi). **[On the Hemolytic Action of Cholera Vibrio against the Erythrocytes of Various Species of Animals.]**—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. June. Vol. 18. No. 7. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 299.]

The authors concluded that the haemolytic power which the cholera vibrio possesses did not act always against all kinds of animals; wide specific differences were met with.

J. H. T. W.

OHWADA (Seijitsu). **[Destination of Cholera Vibrios in the Sewage Water of Tokyo City.]**—*Keio Igaku Zasshi* (*Jl. Kei-O Med. Soc.*). 1924. Feb. Vol. 3. Nos. 11/12. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. pp. 206–207.]

The author mixed cholera vibrios in crude and purified sewage water from Tokyo city in order to determine how long they would live. In crude sewage water they lived for 9 days and in the purified water 8 days. [See this *Bulletin*, Vol. 18, pp. 356–357 (FLU).]

J. H. T. W.

MATSUO (Takeaschi). **[On H-ion Concentration of the Medium for the Cultivation of** *Vibrio cholerae.*]—*Tokyo Iji-shinshi* (*Tokyo Med. News*). 1924. Aug. No. 2384. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 326.]

The author tested the optimal H-ion concentration of the culture medium for *V. cholerae* and found that one having pH of 9·5 was the best. [*cf.* this *Bulletin*, Vol. 21, p. 74 (KABELIK and FREUDMANN).]

J. H. T. W.

PRAUSNITZ (Carl) & HILLE (Georg). **Die Vibriolyse ausserhalb des lebenden Körpers.** [Vibriolysis outside the Living Body.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 480–485. [4 refs.]

The finding of vibriolysins in man and laboratory animals is not new. The authors give a reference to PFEIFFER, 1894. See also "Studies in Immunization," 1909 (Almroth WRIGHT), p. 45 (WRIGHT & WINDSOR, 1901–1902).

J. H. T. W.

HEGGS (T. Barrett). **Cholera in Baghdad.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 15. Vol. 27. No. 8. pp. 85–91.

IIMURA (Yasuzo). **The Occurrence and Prevention of Cholera in Japan.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore.* 1923. pp. 711–724. With 1 chart & 1 map.

——. **The Prevention and Occurrence of Cholera in Japan.**—*Japan Med. World.* Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9 & 10. pp. 217–222.

OKOLSKA (Marja). **O tak zwanej epidemji cholery w Baranowiczach w roku 1922, wraz z uwagami o badaniach na nosicielstwo. Etudes sur l'épidémie de cholera à Baranowicze en 1922 et sur les porteurs des germes.**—*Medycyna Doswiadczalna i Społeczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 353–359.

PATEL (Purshotamdas T.). **Some Observations on the Cholera Epidemic in Bombay, 1923.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 552–554.

SANARELLI (G.). **Patogenesi del colera (VIIIa Memoria). L'algidismo colerico.**—*Ann. d'Igiene.* 1924. Jan. Vol. 34. No. 1. pp. 1–29. [23 refs.]

ENTERIC FEVERS.

FLETCHER (William) & LESSLAR (J. E.). **A Case of Typhoid Septicaemia without Typhoid Ulcers.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 29–31. [2 refs.]

The patient, an old Chinese labourer, was admitted to hospital at Kuala Lumpur, March 11th, 1922; Temp., 103° F.; ill one month. There were no physical signs of disease except a few coarse râles over the lungs. For the first ten days the temperature ranged between 99° and 103° F.; during the following week it was seldom more than 100° F. After the patient had been six days in hospital he began to pass dysenteric stools containing blood and mucus. He died on April 1st. On March 20th his blood was sent to the authors for examination. It agglutinated an emulsion of *B. typhosus* 1 : 7,000. *B. typhosus* was cultivated. Stools which contained blood and mucus were examined on March 22nd, 27th, 28th and 29th, and dysentery bacilli of the Flexner group—Andrewes' type X—were found on each occasion. After death widespread dysenteric lesions were found, involving the whole of the large intestine and the last six inches of the ileum. No typhoid ulcers were found, nor enlarged Peyer's patches. There were two scars, not of recent origin, just above the ileo-caecal valve. The gall-bladder was thickened and *B. typhosus* was grown from it in pure culture. Two strains of the typhoid bacillus were isolated from the patient's blood and his serum agglutinated a stock emulsion of *B. typhosus*. Subtertian malaria parasites were found in the same patient [*cf.* this *Bulletin*, Vol. 12, p. 390 (DE VEZEAUX, DE LAVERGNE & GAUTIER)].

J. H. Tull Walsh.

DE CASTRO (A. Bayley). **Marris' Atropine Test in Typhoid Fever and its Value.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 510–511.

The author describes the test and gives details of cases in which atropine was used for diagnosis. There were no unpleasant results, and the author considers the test excellent for diagnosing typhoid fever [see this *Bulletin*, Vol. 12, p. 390 (FRIEDLANDER & MCCORD); Vol. 9, pp. 466–468 (MARRIS)].

J. H. T. W.

CRUZ (Juan Z. Sta.). [In English & Spanish.] **Autopsy Incidence and Pathological Lesions of Typhoid Fever in the Philippine Islands. La fiebre tifoidea en Filipinas su frecuencia en la autopsia y sus lesiones pathologicas.**—*Jl. Philippine Islands Med. Assoc.* 1924. June. Vol. 4. No. 6. In English pp. 209–214. [13 refs.] In Spanish pp. 238–242.

HIRST (L. Fabian). **On the Parenteric Fevers.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1924. Sept. Vol. 21. No. 2. pp. 72–83. With 1 chart.

JOURNAL OF THE PHILIPPINE ISLANDS MEDICAL ASSOCIATION. 1924. Sept. Vol. 4. No. 9. pp. 341–345.—**The Typhoid Fever Problem in the City of Manila. Report of the Council of Hygiene.**

MAKALINTAL (Ambrosio J.). [In English & Spanish.] **Clinical Study of Typhoid Asthenia. Estudio clinico de la astenia tifodica.**—*Jl. Philippine Islands Med. Assoc.* 1924. June. Vol. 4. No. 6. In English pp. 219–223. [4 refs.] In Spanish pp. 245–248.

MALARIA.

SWELLENGREBEL (N. H.). **De reis der malaria-commissie van den volkenbond naar Oost-Europa en Italië.** [The Visit of the Malaria Commission of the League of Nations to Eastern Europe and Italy.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Jan. 10 & Jan. 17. 69th Year. 1st Half. Nos. 2 & 3. pp. 139–152; 218–228.

The distinguished Commission visited Croatia, Dalmatia, Serbia, Macedonia, Bulgaria, Roumania, Russia including the Ukraine and Moscow, and Italy. For each country there are considered the anti-malarial organization and its cost, the parasite and spleen indices for several years, checked in certain instances by the Commission's own examinations, but mostly mentioned without reference to season. There is much information regarding the incidence of the three kinds of malaria in various parts of the field covered.

The reality of congenital malaria finds much support. In Skradin, Dalmatia, 40 cases are reported in which parasites were found 1 to 5 days after birth. From Persianovka (Don) it was reported that parasites were found within 2 days after birth in 8 cases, and at Zarizyn (Volga) in the blood of mother and child as well as in that of the umbilical cord. It is insisted that infection from *A. maculipennis* is acquired in a house only, and that the likelihood of infection is increased in proportion as houses are more crowded and mosquitoes less harassed.

Clayton Lane.

PITTALUGA (G.). **Observaciones sobre el paludismo en la Macedonia griega.** [Malaria in Grecian Macedonia.]—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 131–157.

This is from the report of the visit of the Malaria Commission of the Sanitary Committee of the League of Nations. Greece has attacked, with the energy and skill compatible with a minimum of material, the problem thrust upon her by the arrival of a million refugees, for her facilities bear poor comparison with those at the disposal of more fortunate Jugo-Slavia. The problem of the colonization of the valleys of the Sturmar and Vardar demands large sanitary works such as Italy has successfully carried through and watchfully maintains.

C. L.

DE BUEN (Sadí) & LUENGO (Emilio). **Contribución de la Sección de Parasitología en la campaña antipalúdica (año 1923).**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 159–202. With 3 charts. [5 refs.]

A large amount of work done in Spain during 1923 shows for the places investigated a splenic index as high as 58·8, and heavy infection with all three species of malaria parasites, the subtertian being sometimes, as at San Pedro del Pintar, more prevalent than the tertian. Anophelism is marked, breeding occurring in seepage pools from canals and wells. Breeding of Gambusia has been continued, and some thousands of trees planted.

C. L.

IOFF (I.). **Die Arbeiten in der Malariabekämpfung des Instituts für Mikrobiologie und Epidemiologie des Südostens Russlands.** [Anti-malarial Work in the Institute of Microbiology and Epidemiology of South-East Russia.]—Communication à la Conférence internationale sur le paludisme organisée par le Comité d'Hygiène de la Société des Nations.—4 pp. 1924. Saratov.

The recent pandemic of malaria in this part of Russia (this *Bulletin,* Vol. 21, p. 291) is considered and recent publications of the Institute enumerated. The maximum incidence of tertian malaria occurs in May, of sub-tertian in September, and of quartan in November; the last, taking place at a period when mosquitoes are held to be entirely absent, is judged indicative of an incubation period of 2 to 3 months. [It will, however, be remembered that MACKENZIE (*l.c.*) reported that Anopheles bred throughout the winter in the almost tropical temperatures maintained in the waterbutts within the houses.]

C. L.

KLIGLER (I. J.), SHAPIRO (J. M.) & WEITZMAN (I.). **Malaria in Rural Settlements in Palestine.**—*Jl. of Hyg.* 1924. Dec. Vol. 23. No. 3. pp. 280–316. With 4 plates, 5 charts & 1 map. [18 refs.]

Statistical and laboratory data show that in Palestine the malaria incidence lies between 50 and 100 per cent. of the population, *P. vivax* constituting 98 per cent. of the February to June epidemic, and *P. falciparum* 40 to 50 per cent. of that from October to December. High malarial incidence shows itself as a high parasite index in children, while both in adults and children the splenic index is high. With control it is naturally the parasite index which first falls; with recrudescence, in spite of control, children show the first rise in these indices. Parasites were detected in 5 per cent. of Jews, as compared with 15 per cent. of Arabs, for the former seek medical aid more freely and indices are the evidence of the balance between infection and cure. A quinine treatment is described, and is compared with one using a slightly smaller dosage of quinidine. The results were almost identical.

C. L.

SWELLENGREBEL (N. H.). **Malaria in the Kingdom of the Netherlands. Report to the Malaria Sub-Committee of the Health Committee of the League of Nations.**—72 pp. With 9 graphs. League of Nations. Health Organisation. C.H. 196. [Proof.]

Experience in Holland of checking clinical diagnosis by blood examination leads to the emphatic refusal to regard the former as being of any value. Accordingly, the previous records of malaria in Holland, whether of the prestatistical or statistical era, cannot be accepted. Compulsory notification, which leaves the medical man free to make his own clinical diagnosis, will produce figures, but figures as worthless as the malaria statistics of former years. Gametes are not held to indicate relapse, for they were found in 56 per cent. of febrile persons who had had no evidence of malaria during the last 2 years, and in 75 per cent. of those who had.

Renewed anopheline activity takes place after 1st June, but many "primary" cases occur before that date. They are explained partly by latency from the previous autumn, partly by the fact that in the Netherlands hibernation of mosquitoes is not complete, bloodfeeds and development of oocysts occurring in stables throughout the winter. Accordingly the tedious and expensive task of detecting gamete carriers on a mass scale in early spring is held useless. No vegetation was found which could be relied upon to prevent larval development of *A. maculipennis.* Heavy shadow does so. It is emphasized that gametocytes of *P. vivax* disappear rapidly under quinine.

C. L.

i. BASS (C. C.). **The Relation of the Malaria-Carrier to Malaria Prevalence.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 61–66. [2 refs.] [United Fruit Company, Boston, Mass.]

ii. JAMES (William M.). **The Localization of Malarial Parasites in Man.**—*Ibid.* pp 67–70.

i. Countless examinations having failed to implicate animals, even as non-optimum hosts of man's malaria parasites, and having proved that every infected host may at one time have no gametocytes, at another many, in the cutaneous blood, it follows that every infected person must be looked upon as an actual or potential disseminator. It is then essential that disinfestation should be attempted for all. The claims of the Standard Treatment to leave but few carriers is urged, and the extent to which qualified and unqualified students of medicine are being educated in this respect is pointed out.

ii. James intimated that cerebral symptoms are no evidence of predominant cerebral localization of parasites, but rather prove toxaemia. The optimum habitats are the spleen and rib marrow, the latter particularly in the case of the gametocytes, and the placental sinuses in that of asexual forms of *P. falciparum.* Whether cerebral stasis due to actual mechanical blocking of capillaries really occurs is held questionable.

In discussion STEPHENS and Gordon THOMSON emphasized that they always, and JAMES that he almost always, found tertian gametocytes if parasites of that species were present at any stage of development. STEPHENS noted the frequent complete absence of crescents for 2, 3 or more weeks after infection, THOMSON their complete absence in 100 adult Rhodesian negroes, and their simultaneous presence in 40 per cent. of their children. CLARKE correlated localization of parasites with circulatory stasis, as in the sinuses of rib marrow, spleen and placenta, where they are found, not murally arranged, but scattered evenly throughout the channel. THOMSON noted how in cultures parasites which develop beyond the ring stage tend to group themselves together and stick to endothelial cells. CASTELLANI held that the *Plasmodium canis* of Ceylon is morphologically identical with *P. vivax.* FÜLLEBORN indicated that without keenness of the inhabitants prophylactic quinine must be useless. Among other valuable points raised were the value of the thick film in nearly doubling the parasite rate (CLARKE); relapse of malaria in England 7 or 8 years after leaving the Balkans (CASTELLANI); the failure of quinine to cure where there is malnutrition (CARTER, HARRIS, STEPHENS); the confusion of repeated relapse with repeated reinfection

(CONNOR); the relation of malaria to rainfall and ground water level (ROGERS); the disappearance after death of parasites which "must have been present during life" (THOMSON); the attempt to investigate the acquisition of immunity, hurriedly stopped by threatening mortality (STEPHENS); and the opinion that the development of gametocytes in benign tertian malaria takes 4, and in quartan 6 days, or double the length of the asexual cycle (JAMES).

C. L.

WOOTTON (W. T.). **Family Physician versus Laboratory Diagnosis of Malaria.**—*Southern Med. Jl.* 1925. Feb. Vol. 18. No. 2. pp. 116–119.

The ordinary clinician, it is held, accepts a diagnosis of malaria according as the parasite is or is not found in one or more blood smears by a laboratory technician of unknown ability, perseverance and reliability. A questionnaire addressed to a number of widely distributed medical men in the South elicited great differences in view as to whether malaria could exist without parasites being detected in the cutaneous blood. Personal experiences suggesting or proving that this may be the case are added, and it is concluded that chronic malaria is an entity, and in the vast majority of cases can only be recognized clinically. It must then be dealt with empirically till such time as refinement in diagnosis is so developed as to make such a procedure unnecessary.

C. L.

LEFÈVRE (R.). **Note sur le paludisme au Soudan français (cercle de Mopti).**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 939–940.

Antilarval measures are held inapplicable to this islet lying in a sea of rice fields. The splenic index in children is 61, the parasite index, including all ages and presumably in thin film, is 21. All infections but one were with *P. falciparum*, the exception by *P. malariae*. Of 36 Europeans taking "quinine," 0·4 to 0·6 gm. daily, only two showed malaria. One held it a point of honour to substitute rum for quinine, the other admitted to taking it most irregularly.

C. L.

CHRISTOPHERS (S. R.). **The Mechanism of Immunity against Malaria in Communities living under Hyper-Endemic Conditions.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 273–294. With 1 text fig. [9 refs.]

The suggestion made (this *Bulletin*, Vol. 21, p. 284) that this valuable work deserved better editing and wider publication than it had hitherto received has happily been carried out. It is now explained how, by ascertaining the area of the preparation covered by the square aperture of the Ehrlich eyepiece with the combination of lenses in use, the volume of the blood examined can be obtained. In this way it is determined that the peculiar condition of a high percentage of infected adults with but few parasites per cc. appears to be a characteristic of acquired immunity or tolerance under hyper-endemic conditions. A spleen extending to 8 or 10 cm. from the umbilicus is associated with acute infestation, a larger one with a reduced parasite rate and some degree of acquired immunity. New arrivals, whether by birth or immigration, into a hyper-endemic area, experience, as previously noted, a period of about 2 years during which "attack" conditions are present, with an average parasite count of 10,000 parasites per cmm. This is followed, as in childhood and adolescence, by one of "immune infestation." Crescents are associated with a high rate of schizonts, that is with "attack" conditions; their proportion in children to asexual forms is about 1 to 400; and their total number per cc. of blood was in these 2,095, as against 132 in an almost equal number of adults.

C. L.

SWELLENGREBEL (N. H.). **Nadere bijzonderheden over de herfst- en winterbesmetting met malariaparasieten van** *A. maculipennis* **om Amsterdam.** [Particulars on the Autumnal and Hibernal Infection of *A. maculipennis* with Malaria Parasites around Amsterdam.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 9. 68th Year. 2nd Half. No. 6. pp. 750–763. With 1 chart. [8 refs.]

This paper records the results of dissection of 10,873 anophelines (9,549 for intestinal and of 1,324 for salivary infection) caught between January, 1920, and May, 1922, in houses in the malaria-districts around Amsterdam where malaria had been observed. The majority of infected insects was found from September till December and again (although in smaller numbers) in February; few or none were found in summer, although May-July marks the apex of the malaria-curve. This is explained by the fact that in autumn and winter the individual anophelines remain in the houses, and if they become infected, are to be found there, whereas in summer they leave the houses to deposit their ova and may not come back, though plenty of fresh new-hatched individuals may take their place. This should be taken into account in all speculations on the influence of meteorological conditions on malaria.

The rate of infection with oocysts reached 5·7 per cent. in autumn, 1920, and 6·2 per cent. in autumn, 1921. In peasants' houses with adjoining stables, where the numbers of anophelines caught in the sleeping rooms was much higher than in urban-habitations, the rate of infection was not lower, even somewhat higher, than in the latter (2–10 per cent. and 4–11 per cent.), the absolute number of infected mosquitoes being much greater. Instances are given of examination of succeeding catches in the same house, showing that it is much more difficult to get rid of the infected mosquitoes in the peasant-homes than in the urban-houses, the construction of the former providing the anophelines with much better shelters.

A portion at least of the infected anophelines show sporozoites in their salivary glands in November-March, which they may inject into humans as they continue to suck blood in winter. If these sporozoites be still viable, infection of the victims must take place, and this may explain the primary cases occurring in early spring (KORTEWEG).

N. H. Swellengrebel.

GRASSI (B.). **Reviviscenza temporanea della malaria in Toscana.**—*Ann. d'Igiene.* 1924. Feb. Vol. 34. No. 2. pp. 81–91.

Three marshy provinces of Tuscany, formerly markedly malarious, have been since 1901 classical instances of anophelism without malaria.

Probably as the result of infected, returning, soldiers, parts of this territory have become intensely malarious, so that in January, 1922, 64 per cent. of the population were found infected. Of 444 inhabitants of Stagno, 71 took prophylactic quinine regularly with no primary case; 373 did not, with 13 primary cases. A case was classed as primary if it showed itself in the pre-epidemic season. Relapses were reduced from 716 in 1922 to 195 in 1923. Of the cases occurring in the pre-epidemic season, one who had taken quinine in the previous year is judged to be primary. Blood examination, practised in many instances, showed but one case not of benign tertian malaria, and that film contained crescents. Quinine was effective in doses which about Rome would have been useless. The author, considering that the phase of intensive malaria of former times lasted many years and that malaria expanded very much, while this time malaria has disappeared almost entirely without spreading itself, comes to the conclusion that certainly the quinine had been of good use, but that also the mysterious " genius loci " must have been helpful.

C. L.

CIGNOZZI (Oreste). **La grossa milza malarica nell' etiopatogenesi dell' appendicite.** [An Enlarged Malarial Spleen in the Causation of Appendicitis.]—*Riforma Med.* 1925. Jan. 12. Vol. 41. No. 2. pp. 32–34.

It is stated that appendicitis and malaria occur in Maremma equally in spring and autumn; that about 85 per cent. of appendicitis cases have had malaria, and that in 90 per cent. of these the spleen is enlarged; that this enlargement, by compressing the colon, induces distension of the ascending colon and caecum; and that the consequent constipation and congestion, constantly recurring, induce appendicitis and periappendicular lesions. In which case appendicitis should surely fill all tropical hospitals.

C. L.

ANTIĆ (D.). **Immunität der Malariker gegen Superinfektion.**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 28. Vol. 94. No. 2. pp. 134–137.

The writer adds two to the reported cases of failure of a second injection of blood containing *P. vivax* to produce reappearance of the parasites in the cutaneous blood, a first injection having induced infection, and treatment of that infection having ceased sufficiently long for there to be no persistence of quinine excretion.

C. L.

AFFRE (M.). **Le paludisme dans les suites de couches.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 110–116. With 2 figs.

In Dakar malaria constantly appears after labour, benign in character, although caused by *P. falciparum.* The lochia disappear. Lactic secretion is interfered with. Oral treatment with quinine is effective.

C. L.

JONES (J. Llewelyn) & BROWN (H. C.). **A Case of Congenital Malaria occurring in England.**—*Lancet*. 1924. Nov. 22. p. 1058. [8 refs.]

The mother, who had never travelled further east than Venice, had irregular fever during the last 2 months of pregnancy. It rose to 104° on the day after her delivery in Buckinghamshire, the blood showing a heavy benign tertian infection. The child's temperature rose for the first time on the 16th day. When examined, its blood showed the same infection with numerous gametocytes. In the absence of the known local presence of Anopheles, and of information regarding the possibility of transmission of infection through milk, the most obvious conclusion is held to be a congenital infection. The time of year is not noted.

C. L.

SINTON (J. A.) & HUGHES (T. A.). **The Functional Capacity of the Liver in Malaria, with Special Reference to the Levulose Tolerance Test.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 409–422. [73 refs.]

A convincing citation of the findings of those who have studied the question shows that a satisfactory glycogen reserve is necessary for the proper carrying out of all liver functions; that the glycogenic function is disturbed in some acute attacks of subtertian malaria of ordinary severity, and is probably more interfered with in pernicious onsets. These considerations suggest that ingestion of glucose or levulose is indicated in all cases of malaria.

C. L.

MONTELEONE (R.). **Contributo allo studio della funzionalita' epatica nella malaria acuta e cronica.**—*Problemi d. Nutrizione.* Rome. 1924. July. Vol. 1. No. 7. pp. 381–389. [14 refs.]

Blood examination of 275 cases of tertian, subtertian and quartan with a few of chronic malaria leads to the conclusion that bile pigment is present in 6 and urobilin in 95 per cent. Glycogenic function is altered in 30 per cent., proteolytic in 60, antitoxic in 50, the fat metabolism in none.

C. L.

RUDOLF (G. de M.). **Spontaneous Splenic Rupture in Malarial Treatment.**—*Lancet.* 1924. Nov. 22. p. 1057. [13 refs.]

Le Scalpel having recorded a case where a general paralytic, after experiencing 8 rigors from artificially induced malaria, died in bed of a ruptured spleen, Rudolf compares the spleen of general paralytics with non-paralytics with a view to determining whether its structure suggests a greater likelihood of rupture. The conclusion is that the syphilitic spleen is apt to be fibrous, and so less liable to rupture when distended than is the normal one.

C. L.

SERGENT (Edm. & Et.), PARROT (L.), FOLEY (H.) & CATANEI (A.). **De l'emploi de la quinine contre le paludisme.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 28–32. [3 refs.]

The experience of these writers leads them to the following conclusions. Therapeutic quinine should ordinarily be given by mouth in doses not exceeding 2 gm. daily, intravenous injection being reserved for pernicious attacks. Intramuscular quinine should not exceed 3 per cent. in strength. Prophylactic quinine is no absolute protection against infection, but renders attacks mild and should be taken daily. It renders the recipient less dangerous to his fellows. Mass prophylactic quinine is automatic, sufficiently effective, not troublesome, and readily accepted. A special administrator enters into the scheme.

C. L.

DEEKS (W. E.). **Prevention and Treatment of Malaria.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 28. No. 2. pp. 21–26. [3 refs.]

Considering two recent papers by Warrington YORKE & MACFIE, and by HANSCHELL (*ante* pp. 50 and 60), Deeks adds these facts. In Panama the treatment found most efficacious for acute cases was 15 grains of quinine three times a day during fever, and thereafter 10 grains three times a day for 5 days. Relapses were greatly lessened. For chronic cases the treatment of concomitant infections such as syphilis and ankylostomiasis is held essential, the value of arsenic being attributed to its influence on syphilis. Measures reasonable for the handling of labour camps in malarial regions are described, the continuous issue of prophylactic quinine to all persons being held justifiable only if a high percentage of infection and many mosquitoes are both existent.

C. L.

SEGUIN (T.). **Du traitement du paludisme, maladie essentiellement curable. (3e Communication.)**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 660–692.

Seguin returns to the theme (this *Bulletin*, Vol. 21, p. 853) that malaria is always and everywhere easily curable in doses of 5 cgm. per kgm. for 3 days during fever, and of 3·75 cgm. per kgm. thereafter for 10 days, corresponding in an ordinary individual to about 40 and 25 grains daily. If gametocytes have appeared, the treatment must be continued for 60 days. Where fever has reappeared no explanation is accepted other than that it is a reinfection. Under no conditions, it is held, does quinine produce digestive disturbance or abortion.

A number of instances are quoted where adequate quinine dosage (which was evidently being withheld in the French Soudan for fear of blackwater fever) produced excellent results.

In discussion, MONTEL would limit oral administration to some rare cases of benign tertian malaria, substituting for ordinary use ABRAMI'S dilute subcutaneous injections.

C. L.

HODSON (V. S.). **Individual Resistance in the Cure of Malaria.** [Correspondence.]—*Lancet.* 1925. Jan. 17. p. 156.

It is suggested that neither in "A Critical Consideration of the Treatment of the Malarias" (this *Bulletin*, Vol. 21, p. 849) nor in the *Lancet's* leader thereon (Jan. 3rd, 1925) is sufficient weight given to individual resistance, it being held elementary that the severity of a disease varies with the relation of the "dosage" of the infection to the resistance of the individual. This is believed to have been lowered in war time not only by physical hardships, but by the ever present expectation of wounds and death; while in peace time the rare failure of treatment is attributable to faulty administration or to concomitant infections.

C. L.

HODSON (V. S.). **The Treatment of Malaria.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp 321–322. [2 refs.]

In the belief that intermittent administration of quinine permits of the production of resistance, while its continuous administration does not, the drug is ordered in daily doses of 20 grains (1·3 gm.) on three consecutive days a week for 3 or 4 weeks; for the same period for 2 days a week; and finally also for 1 day weekly; beginning the course always on the same day of the week. No figures accompany the paper.

C. L.

REINHOLD. **Le traitement de la malaria par la quinine alcaline de Sinton.**—*Bruxelles Méd.* 1924. Dec. 28. Vol. 5. No. 9. pp. 313–314.

COL. J. L. BULTEEL, I.M.S., is reported as having treated 271 cases during a full year with SINTON's alkaline quinine mixture (this *Bulletin,* Vol. 20, pp. 300 and 971) with 28, or 10·33 per cent., of relapses. The amount of quinine used per case was 11·7 gm.

C. L.

PLEHN (A.). **Zur Frage der sogen. "Chiningewöhnung."** [On Quinine Habituation.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 538–539.

A man taking in Westphalia since childhood 0·6 gm. of quinine daily for one month in every four, was taken prisoner on the German eastern front and sent to the Southern Urals and Siberia. He developed fever and was dosed with a teaspoonful of quinine three times a day. An attack of blackwater supervened, but quinine was later continued in half teaspoonful doses, and afterwards 2·4 gm. daily, during which latter period urinary excretion lay between 0·012 and 0·103 gm. daily. He stated that quinine had no ill effects on him and that without it he was weak and useless. Yet PLEHN reduced it to 0·5 gm. daily. Malaria parasites were never found. Perusal of this *Bulletin* (Vol. 21, pp. 292 and 298) increases the natural doubt whether the enormous doses received really were unadulterated quinine.

C. L.

MACPHAIL (N. P.). **Administration of Quinine in Acute Malaria, with Special Reference to the Value of Intramuscular Injections.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 89–95. (Discussion, pp. 95–109.) [United Fruit Company, Boston, Mass.]

This paper and its discussion are markedly important. Macphail shows that those who received quinine in solid form either as powder, capsules or friable tablets required, less frequently than did those who received the solution, the use of those intramuscular injections with which he treats all, or practically all, his grave cases. The series covered 2½ years, thus excluding seasonal influence. Regarding intramuscular injections the paper and discussion show the usual marked divergences of opinion, which indicate perhaps a general failure to realize that skilled experience can only differ so emphatically because there are unknown factors whose very existence is not realized. Macphail, AGRAMONTE and DEEKS urged that necrotic abscess is avoidable, by use of the bihydrochloride, by complete asepsis, by slow injection, by thorough massage and the use of a hot bottle, single injection of 15 to 22½ grains taking up 15 minutes of a nurse's time. BASS was gravely impressed by the damage, experimental and clinical, which quinine inflicts upon the tissues, and by the uncertainty of its absorption therefrom. CRAN mentioned 15,000 intramuscular injections given by Macphail's dispensers with practically no necrosis. BASS urged that, by the evidence, intramuscular quinine is absorbed more slowly than it is by the mouth. JAMES and Macphail note that for cases grievously ill in the bush an intramuscular injection by a dispenser will enable them to reach a doctor alive and better, instead perhaps of dying by the way. The risk of tetanus is held negligible. Those not using intravenous quinine much are more impressed with its difficulties than those who do. The value of friable tablets as against the too common stony ones, and the fact that quinine given twice daily (20×2 grs.) proved as efficacious as when given three times (15×3 grs.) are stressed.

C. L. .

MURPHY (R. A.). **Intramuscular Quinine.** [Correspondence.]—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 48–49.

As a protest against a " stunt " revival by the *Indian Medical Gazette* of the dangers and inutility of intramuscular injections of quinine is lodged the statement that the writer has given many such with happy results, and is giving more as his experience increases. Risk of ill effects with proper precautions is held negligible. The arm should never be used. An editorial note, while agreeing that the arm should not be used, instances a recent death from tetanus where every possible precaution had been taken to insure sterilization.

C. L.

STERN (E.). **Ueber Glutealabszesse nach intramuskulären Chinineinspritzungen. Erfahrungen gesammelt in Palästina.** [Gluteal Abscess after Intramuscular Quinine Injection. Palestine Experiences.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 69–72.

This statement merits attention. When quinine was intramuscularly injected during high fever Stern practically never got abscess or necrosis. If injected between febrile attacks he could practically always recover masses of quinine crystals from the necrotic mass which resulted.

C. L.

ACTON (Hugh W.) & CHOPRA (R. N.). **The Local Effects produced in the Tissues by Intramuscular Injections.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 251–255. [4 refs.]

The vigorous language in which the conclusions are expressed should not distract attention from the striking results of the experiments recorded. When intramuscularly injected into rabbits the double tartrates of potassium and sodium produced extensive subcutaneous and intramuscular oedema, friability, widespread hyperaemia, punctate haemorrhage, but no necrosis. Emetine hydrochloride produced no hyperaemia, slight oedema, but extensive petechial haemorrhage. Quinine bihydrochloride caused slight hyperaemia and haemorrhage, extensive oedema, but necrosis with the alkaloid precipitated as a fairly soluble base. The acid salt, injected into the alkaline tissues of the body, has a pH of 7·2 to 7·4, and is precipitated as base with a solubility of 1 in 2,000, an acid radicle being liberated.

As to whether base or acid is responsible for the necrosis :—

A third of a cc. of hydrochloric acid having the same pH as quinine bihydrochloride, namely, 1·17, produced slight muscular oedema and no necrosis. Eighty mgms. of quinine or quinidine base suspended in 1 cc. of normal saline produced a good deal of necrosis, some ecchymosis, and slight oedema. Indeed, all four cinchona bases produced necrosis with but little to choose between them.

" To bury the needle deep in the muscles and fondly imagine that no injury to the tissues occurs is similar to the illusion which affects the ostrich when it buries its head in the sand. The injection of these alkaloidal salts into the muscles of man should be considered as malpraxis. There is only one method of administering the cinchona alkaloids, and that is by mouth. Very rarely in grave cases, *e.g.*, cerebral malaria, when an immediate action is required, quinine base should be injected intravenously.

Three deaths from tetanus, the result of intramuscular injection, are recorded, one particularly striking, since the syringe had two minutes' boiling. But the altitude was 6,000 feet and the boiling point only 94° F., at which temperature tetanus spores are not killed within two minutes.

C. L.

STRADOMSKY (Boris). **Ueber die Behandlung der Malaria mit intravenösen Chinininjektionen.** [Treatment of Malaria by Intravenous Injection of Quinine.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28. No. 11. pp. 488–495.

224 persons were treated with 1,703 injections, the average number for cases of benign tertian malaria being about 6, of subtertian and mixed malaria about 10, and of quartan malaria about 13. The amount and spacing of the bihydrochloride seem to have varied considerably, and thrombosis of the punctured veins not infrequently necessitated the continuing of the treatment by mouth. Abscess formation twice occurred in the early days. The courses varied from 1 to 4. Of cases who had gone through one course 77 per cent. of those followed up relapsed, of those undergoing 2 courses 92 per cent., and of three or four 100 per cent. Of those treated in autumn 82 per cent. had relapsed by the following spring. The average interval between treatment with one course of injections and relapse was, in the autumn 170 days, but in the spring only 10·8 days. Similarly, subtertian cases treated in the autumn were apt to " relapse " in the

spring as tertians. If quinine were given on the fever-free day of a benign tertian malaria the paroxysm due next day was cut out in 85 per cent. of 60 cases; while in 25 cases of oral administration the figure was 64. The conditions of work did not exclude reinfection.

C. L.

SUZUKI (T.). **Cases of Malarial Fever treated per Rectum with Quinine.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 233–238. With 3 charts.

Having established, so he notes, that the lethal dose of quinine for rabbits was *per rectum* about half that *per os*, Suzuki has consistently advised the former route, and here gives three illustrative cases treated after detection of plasmodia.

C. L.

SERGENT (Etienne). **La cinchonidine et la splénomégalie d'origine paludéenne.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 178–180. [2 refs.]

Prompted by experiments showing that cinchonidine (this *Bulletin*, Vol. 21, p. 290) like quinine (Vol. 17, p. 308) lessens splenomegaly in bird malaria, 12 splenomegalies in man were treated with hydrochloride of cinchonidine at the rate of 40 cgm. daily for an adult; 8 controls being treated with quinine sulphate, presumably in the same doses. The former gave better results than the latter. That the splenomegaly was malarial was accepted on clinical grounds.

C. L.

MARCHOUX (E.). **Action de l'arsenic sur le paludisme à** *P. vivax.*—*C.R. Acad. Sci.* 1925. Feb. 23. Vol. 180. No. 8. pp. 617–618. [1 ref.]

To 44 persons, 19 showing *Plasmodium malariae*, 13 *P. falciparum* and 12 *P. vivax*, Marchoux administered stovarsol in 1 gm. doses, orally, subcutaneously, intramuscularly and intravenously. In every case *P. vivax* rapidly disappeared, the other forms being unaffected. In one man infected with both the tertian forms *P. vivax* disappeared, *P. falciparum* did not. The difference, it is pointed out, indicates a specific difference in the parasites.

C. L.

MARCHOUX (E.) & COHEN. **Le stovarsol est, contre le paludisme, au moins aussi actif que la quinine.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 132–133. [4 refs.]

Sodium stovarsol given intravenously once in unstated dosage to each of 7 general paralytics into whom benign tertian malaria had deliberately been inoculated induced disappearance within 4 to 6 hours of mature schizonts and gametocytes, and within 24 hours of all stages. The effects upon disinfestation as judged by relapse are unknown.

C. L.

DUROEUX (L.). **Traitement du paludisme par les sels arsenicaux. Les résultats de six années d'expérimentation.**—*Bruxelles-Méd.* 1924. Nov. 16. Vol. 5. No. 3. pp. 92–95. [4 refs.]

To some 24 cases, treated with arsenical salts and followed up for several years, are added three more, epileptiform, haemoglobinuric and larval, in two of which crescents, but apparently no rings, were seen. It is concluded that among the derivatives of 606, sulpharsenol, the least toxic, is the most active, particularly against malaria, for which it should be given in small daily injections.

C. L.

WALKER (J.). **Die Behandlung von Malaria mit Peracrina.** [Treatment of Malaria with Peracrina.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 540–570. With 8 charts in text. [15 refs.]

Peracrina is a mixture of white of egg with trypaflavin. It is concluded from tests on 116 cases of tertian, subtertian, and mixed malaria that it is a specific which in many cases will replace and in the others will supplement quinine. Three cases are given in sufficient detail to enable the claims to be checked. In one, a primary benign tertian, plasmodia other than gametocytes persisted in the blood through 86 days of treatment, in a chronic tertian case for 51 days, and in a mixed tertian case for 58 days. Three deaths occurred.

C. L.

SINTON (J. A.). **Methods for the Enumeration of Parasites and Leucocytes in the Blood of Malarial Patients.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 341–346. [4 refs.]

The various methods hitherto employed for estimating the number of malarial parasites in cutaneous blood are critically considered, particularly that of DREYER for counting foreign blood cells. A suspension of fowl's erythrocytes in normal saline and mercuric perchloride (1 in 3,000) will suspend evenly and keep indefinitely. It is standardized to, say, 20,000 erythrocytes per cmm. Equal parts of blood and of this suspension are measured in a pipette and thoroughly mixed on a slide. After spreading and drying for 24 hours the preparation is stained with weak Giemsa. Over a large number of fields, using a square aperture, there are, separately counted, malaria parasites, fowl's erythrocytes, and, if desired, leucocytes. The formula $20{,}000 \times \frac{\text{number of parasites}}{\text{number of avian cells}}$ gives the number of malaria parasites per cmm.

C. L.

BARBER (M. A.) & KOMP (W. H. W.). **Some Modifications of the Thick Film Method in the Examination of Blood from** [*sic*] **Malaria Parasites.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 110–117. With 6 text-figs. [United Fruit Company, Boston, Mass.]

Of the Mass Diagnosis of the Malarias the following method is typical. Twenty-five slides, 3 × 1, each with a thick preparation at one end and a thin smear with the identification mark written in it at the other, are so stacked that the thin ends overlie one another, and are kept apart by pieces of cardboard covering that half of the slide. A rubber band round this end of the stack keeps all together, the thick preparations lying free between the teeth of the "comb" so formed. The thick-preparation-half of the stack is immersed in clean water and then stained in good Giemsa solution, a strength of 1¼ to 75 cc. of water sufficing for 25 slides; the stack, moved once or twice, is left there for half an hour. These thick films were found reliable and time saving, confirmation by the thin film being, in fact, found unnecessary. CLARK noted that the thick film gave him 45·8 per cent. of positives, as against 17·5 with the thin. STEPHENS, W. M. JAMES and JOHNS advocate decolorizing with acetic alcohol and subsequent neutralization as giving a method in which the small rings stain, as they do not in Barber and Komp's technique.

C. L.

SINTON (J. A.). assisted by BANERJEA (A. C.). **Notes on the "Thick-Film" Method of Examination for Malarial Parasites.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 537–544. [6 refs.]

When two persons for whom the thin film had been that of choice for many years plead for the extended use of the thick film their arguments must surely be respected by the most sceptical The difficulties are frankly stated and the results compared. They are tabulated below and speak for themselves :—

		P. vivax.		*P. falciparum.*	
		Thin.	Thick.	Thin.	Thick.
Parasites in 100 fields :	proportion	1	4	1	16
Parasites found in 2 minutes :	,,	1	7·7	1	22
Time required to find first parasite :	,,	1	6·6	1	23

C. L.

GORDON (R. M.). **Changes in the Blood in Primary Malaria.**—*Ann. Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 595–599. With 3 charts. [3 refs.]

The number of erythrocytes, the percentage of these infected, and the colour index are studied in 3 cases of *P. vivax* infection deliberately induced in England for the treatment of general paralysis. In 2 cases (BEN-HAREL, this *Bulletin*, Vol. 21, p. 138; Ross, p. 297) erythrocytes diminished before parasites were detected, and in one this fall continued after they ceased to be found. Parasites increased in number for 5 days after their first appearance in the cutaneous blood, and then, quite apart from quinine administration, lessened in numbers. Anaemia was of the simple type. In 2 cases the treatment consisted of 30 grains (2 gm.) on 2 consecutive days, and no parasites were found again on the 12 and 25 days following their immediate, or almost immediate, disappearance, these being the periods during which observation was continued.

C. L.

HOROWITZ-WLASSOWA (L.). **Experimentelle Beiträge zur Frage der Malariaimmunität. (Spezifische Komplementablenkungsreaktion bei Malaria.)** [Specific Complement Deviation in Malaria.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1924. July 5. Vol. 40. No. 3. pp. 268–277.

A specific antibody is formed in those infected with malaria and is made evident by complement deviation, using as antigen malarial placenta. The quantity of antibody is variable; it is absent where there are many schizonts or gametocytes in the cutaneous blood, and persists in many cases for 5 years. About 10 per cent. of those who have never had malaria may show it.

C. L.

ANTIĆ (D.). **Experimentelle Arbeiten ueber die Immunität der Malaria.** [Experiments on Immunity in Malaria.]—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 28. Vol. 94. No. 2. pp. 130–134.

Three rabbits injected intravenously or subcutaneously with half to 1 cc. of blood containing *P. vivax* or *P. falciparum* did not become infected. One man injected intramuscularly with a mixture of 2 cc. of rabbit's blood and an equal quantity of blood containing *P. vivax* became infected. A subtertian case twice injected intramuscularly with 3·5 cc. of rabbit's blood, and a tertian case similarly injected with 2 cc. were not cured. It is concluded that rabbit's blood is refractory, not because it contains parasiticidal substances, but because the parasites cannot force their way into a rabbit's erythrocytes.

C. L.

MONTEL (M. L. R.), TRAN VAN AN & DANG VAN CUONG. **Tension artérielle et viscosité sanguine dans le paludisme chez les Annamites de Cochinchine.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 799–811.

The arterial tension and blood viscosity of 68 Annamites, held to be suffering from malaria although parasites (benign tertian) were found in 2 only, are compared with the similar conditions in 41 controls held to be non-infected. It is concluded that the normal Annamite has a blood pressure lower than the European, the difference being accentuated when malaria occurs without acute attack. In this case viscosity is increased.

C. L.

STEFKO (W. G.) & BOTCHKAREFF (P. V.). **Sur quelques propriétés morphologiques du sang dans le paludisme.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 631–637. [1 ref.]

Acute malaria has, it is held, five forms of leucocytic formula: (1) Before the attack a very marked mononucleosis with eosinophilia; (2) as the attack begins an ordinary leucocytosis, generally feeble; (3) in the hot stage a large-mononucleosis with little, or in grave cases no, eosinophilia; (4) in the sweating stage there appear leucocytes with deeply indented or duplicated nuclei. In chronic malaria leucopenia with lymphocytosis is held the rule. In the South West Crimea, where 50 to 100 per cent. of a sparse population (sparse because so many have died of starvation) is infected with *P. vivax*, mononucleosis is

" normal." In the absence of plasmodia diagnostic reliance is placed on pigmented leucocytes (62 to 70 per cent.) and Turk's cells 19·4 per cent.).

C. L.

WEEBER (Richard). **Beitrag zur Frage der Malariablutkonservierung.** [A Note on the Preservation of Malarial Blood.]—*Wien. Klin. Woch.* 1924. Dec. 25. Vol. 37. No. 52. pp. 1326–1328. [8 refs.]

Four leeches were fed on a case of malaria during an attack. After intervals of 42, 52 and 52 hours 1 cc. was removed by puncturing a leech with a syringe and was injected subcutaneously into three general paralytics. In one of the cases infection, microscopically established, occurred. The kind of malaria parasite seems nowhere to be mentioned.

C. L.

i. BARZILAI-VIVALDI (Gemma) & KAUDERS (Otto). **Unübertragbarkeit alter Impfmalariastämme durch Anophelen.** [Old Inoculation Strain of Malaria not conveyed by Anopheles.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1924. Nov. 10. Vol. 103. No. 4. pp. 744–763. [7 refs.]

ii. PLEHN (A.). **Beobachtungen bei Paralytikermalaria.** [Induced Malaria in Paralytics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 56–65. [1 ref.]

The questions raised are of marked biological interest.

i. Laboratory-bred *Anopheles maculipennis* were fed on 11 benign tertian malaria cases who had been injected with two of Wagner-Jauregg's strains which had undergone respectively 82 and 95 direct passages through man and were practically free from gametocytes. The mosquitoes which survived for 13 days inflicted 127 bites upon 6 malaria-free persons, none of whom developed malaria. The temperature at which the mosquitoes were kept seems nowhere to be stated. It is concluded that these " gametocyte-free " strains are harmless in any land.

ii. A Palestinian strain which persisted through 20 passages covering two years as a small parasite, segmenting when about half filling the erythrocyte and producing no gametocytes, suddenly, under conditions held to exclude contamination, took on all the ordinary tertian characters, including gametocyte formation.

C. L.

DAVIDSON (T. Wishart). **Treatment of General Paralysis by Malaria.**—*Brit. Med. Jl.* 1925. Mar. 7. pp. 452–453. [5 refs.]

Of 53 cases treated with an Indian strain of *P. vivax* the infection was conveyed by *Anopheles maculipennis* in 23 and by injection in 30. The shortest, average and longest incubation periods were for mosquito infection 7, 14, 20 days, for intravenous, 4, 7, 19, for intramuscular, 10, 16, 23. " Spontaneous cure " occurred in 34 per cent. of 23 cases, in which ten rigors were permitted. In 30 cases the treatment was terminated earlier by the administration of 30 grains of quinine daily for 3 days. Of the 23 mosquito infections 13 or 56·5 per cent. relapsed; of 30 inoculated cases only 1 or 3·3 per cent. The period of observation was 21 days to 11 months. The relapses had the same treatment. In some cases 2, 3 or 4 further pyrexial attacks occurred. It is unfortunately not clear from the paper whether the spontaneous " cures " were at once treated with quinine, but it is evident from the figures that in many of them there must have been relapse.

C. L.

PLEHN. **Die Malariabehandlung der progressiven Paralyse. II. Mitteilung.** [The Malaria Treatment of General Paralysis.]—*Deut. Med. Woch.* 1924. Dec. 26. Vol. 50. No. 52. pp. 1827–1828.

The writer lost three of 17 cases treated by deliberate infection of subtertian malaria, although they were checked daily by thick drop examination. He advises, therefore, the examination of at least two smears daily, the percentage of infected corpuscles being in this way checked, and holds that this procedure gives safety ; although he notes that the increase of parasites in the peripheral blood does not run parallel with the fever.

C. L.

BUNKER (Henry A.) & KIRBY (George H.). **Treatment of General Paralysis by Inoculation with Malaria. A First Report.**—*Jl. Amer. Med. Assoc.* 1925. Feb. 21. Vol. 84. No. 8. pp. 563–568. [20 refs.]

Two strains of benign tertian malaria were used with the following thermal effects : -

	Strain A.	Strain C.
Number of febrile attacks observed	125	340
Percentage of attacks in which the temperature reached at least :		
104° F.	58	91
105° F.	23	86
106° F.	3	64

Strain C had undergone 22 direct passages by intravenous injection, and appeared to be increasing in pyrogenetic virulence.

C. L.

SAAD (B.). **Les crises fulgurantes du tabès et le paludisme.**—*Ann. Dermat. et de Syph.* 1924. Oct. 6th Ser. Vol. 5. No. 10. pp. 597–599.

In a tabetic with *P. vivax* infection each febrile access produced acute lightning pains. These disappeared in the interval and were finally removed by treatment with quinine. Relapse followed, accompanied by the same pains. Both now yielded to cinchonidine.

C. L.

SEIDELIN (Harald). **The Preventive Use of Quinine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 203–206. [3 refs.]

The writer advocates the week-end prophylactic consumption of quinine, namely, 1 gm. of the hydrochloride on two consecutive days, or on 2 days with one quinine-free day between. The malarial attacks among those so treated have been few and mild, and the number of working days lost only 0·3 per cent. The system adopted is the issue of a bottle of tablets containing sufficient for 3 months, with a blood examination before the issue of the next bottle. At these examinations 65 of 90 persons living continuously at Kinshasa, Belgian Congo, showed parasites in thick films. To those found infected a ten days' course of 1 gm. daily of the salt is given, and parasites have nearly always failed to be found at its end. Nevertheless, certain persons found with infections and yet not treated seem always to have experienced a spontaneous disappearance of parasites. It is held that the conditions correspond exactly to what might be expected in any infective disease if a specific treatment be started during the incubation period, a conclusion which seems to assume that these cases are new infections, and which does not explain the disappearance of parasites in those who had no special treatment.

C. L.

LEGENDRE (J.). **A propos de l'efficacité de la quinisation préventive dans la prophylaxie de la malaria.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 875–880. [18 refs.]; and 1925. Jan. 14. Vol. 18. No. 1. pp. 7–15. [Discussion.] [5 refs.]

A considerable body of evidence is marshalled from various sources, from which it is concluded that prophylactic quinine is ineffective, and that in doses of less than 0·9 gm. it masks infection without preventing or curing it. This point of view met with no apparent support from any other member of the Society.

C. L.

BERTRAND. **Administration de la quinine en capsules.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 175–176.

Prophylactic quinine should not be given in daily doses of less than 0·5 gm. No case of blackwater fever has ever been recorded where quinine dosage has been acknowledged as regular. These doses may, however, cause inconvenience, especially in women, a consideration which may justify their omission in healthier spots.

C. L.

VALCKE. **Quinine preventive.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 173–175.

"Capsules" containing quinine are, it is said, daily reported in the medical press as being passed unchanged in the stools.

C. L.

i. VAN STENIS (O.). **Acerca de dos casos de fiebre terciana maligna.** [On Two Cases of Subtertian Malaria.]—*Rev. Med. y Cirug.* 1924. May 31. Year 7. No. 74. pp. 152–154.

ii. STRICKLAND (C.). **Notes on Malaria in Hill-Stations in or near the Eastern Himalayas.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 549–550. With 1 chart in text. [3 refs.]

iii. MASSON (Clement B.). **The Effect of Malaria on the Nervous System with Special Reference to the Malarial Psychoses.**—*Amer. Jl. Med. Sciences.* 1924. Sept. Vol. 168. No. 3. (No. 630.) pp. 334–371. [53 refs.]

iv. LE DANTEC (A.). **Accès fluxionnaires intermittents palustres.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 773–778.

v. CORRIGAN (S. Harvey) & CORRIGAN (Cecil Edwin). **A Case of Tertian Malarial Fever following an Operation for Appendicitis.**—*Canadian Med. Assoc. Jl.* 1924. Dec. Vol. 14. No. 12. pp. 1204–1205.

vi. FARRERAS (P.). **Acerca del paludismo.**—*Rev. Española de Med. Cirug.* Barcelona. 1924. Dec. Vol. 7. No. 78. pp. 730–740.

vii. VAN DEN BERGH (D.). **Das Anfangsfieber bei primärer autochthoner Tertianamalaria.**—*Klin. Woch.* 1925. Jan. 8. Vol. 4. No. 2. p. 73. With 1 chart in text.

viii. FLOROS (A.). **Liquorbefund bei Malaria perniciosa.**—*Ibid.* Jan. 29. No. 5. p. 214.

i. Asthmatic symptoms, accompanied in one case by urticaria, came and went *pari passu* with the fever in these Venezuelan sisters, and disappeared finally under quinine. Such symptoms were not encountered with other species of malaria parasites.

ii. A symposium of the work of McCombie YOUNG and SHORTT (this *Bulletin*, Vol. 21, p. 595) in Shillong, and of his own (*tom. cit.*, p. 607) in Kurseong. The incidence of malaria in Shillong is inversely as the rainfall of the previous year. Contour drains are advocated for this station.

iii. Four depressive states in malarious subjects cleared up under quinine.

iv. Intermittent swelling and urticaria occurred in one in whom no evidence was found of Loa or of Plasmodium.

v. A woman left Temesvar, Roumania, in February and developed appendicitis with benign tertian malaria in Southern Saskatchewan, Canada, in July of the same year. The possible date and mode of infection are discussed.

vi. This résumé of malaria literature contains a reference (*Riv. de Biol.* 1923, fasc 1) in which, it is stated, GRASSI claims to have been the first to surprise a microgamete of subtertian malaria impregnating a macrogamete of tertian malaria.

vii. It is deemed noteworthy that the primary fever of simple tertian malaria may be continuous.

viii. In a youth of 20 with crescents found in a thick film, strongly positive Wassermann, Sachs-Georgi and Hecht reactions, and no history of syphilis, congenital or acquired, all the signs cleared up under quinine without arsenic.

C. L.

i. GRASSI (Battista). **Twenty-Five Years After. A Chronicle of the Discoveries relating to the Mode of Transmission of Human Malaria.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 355–364.

ii. —. **Nach fünfundzwanzig Jahren. Chronologische Uebersicht der Entdeckung der menschlichen Malariaübertragung.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Aug. 22. Vol. 92. No. 5-6. pp. 392–397. [3 refs.]

iii. DUMITRESCO-MANTE. **Sur un cas d'urticaire palustre. Crise hémoclasique précédant l'accès fébrile urticarien.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Feb. 12. Year 41. 3rd Ser. Vol. 49. No. 5. pp. 200–202. [10 refs.]

iv. MONTELEONE (Remo). **Frequenza del polso come equivalente di accesso malarico.**—*Policlinico.* Sez. Prat. 1925. Mar. 2. Vol. 32. No. 9. pp. 305–308. With 1 chart. [9 refs.]

v. GABRIEL (C.). **Accès a-parasitaires provoqués chez les paludéens traités par l'eau minérale d'Encausse (Haute-Garonne).**—*C.R. Soc. Biol.* 1924. Dec. 12. Vol. 91. No. 35. pp. 1255–1256.

vi. MACKENZIE (Ian). **Notas preliminares sobre una investigación de patologia y tratamiento del paludismo.**—*Gac. Méd. de Caracas.* 1924. Aug. 15. Vol. 31. No. 15. pp. 227–229.

vii. KLUGE (Otto). **Behandlungsschema für chininfeste Malaria.**—*Deut. Med. Woch.* 1925. Jan. 30. Vol. 51. No. 5. p. 193.

viii. CAUSSADE (G.) & TARDIEU (André). **De quelques indications de la méthode de Bretonneau-Trousseau : traitement de certaines formes de paludisme.**—*Presse Méd.* 1924. Dec. 13. Vol. 32. No. 100. pp. 989–990. [8 refs.]

ix. SCHILLING (Viktor), JOSSMANN, HOFFMANN (Karl), RUBITSCHUNG & VAN DER SPEK. **Biologisch-klinische Blutstudien über allgemeine Infektionsfragen an der Impfmalaria der Paralytiker, besonders über ihre unspezifische Wirksamkeit.** [Biological and Clinical Blood Studies in Induced Malaria in Paralytics.]—*Zeitschr. f. Klin. Med.* 1924. Oct. 25. Vol. 100. No. 6. pp. 742 776. [58 refs.]

i & ii. The reopening of this controversy seems to call for no alteration in the position already defined in this *Bulletin* (Vol. 20, p. 613 ; Vol. 21, p. 616).

iii. In an infection with *P. vivax* each access was accompanied by urticaria ; parasites, fever and urticaria disappearing together under quinine.

iv. In a mixed infection with *P. vivax* and *P. falciparum* after fever had spontaneously disappeared, isolated irregular attacks of tachycardia were correlated with parasitic evolution [presumably with sporing].

v. "Malarial" cases treated with baths at Encausse, Haute-Garonne, usually have a sharp rise in temperature to about 40° C. soon after beginning treatment. No plasmodia have ever been found in these attacks.

vi. The basis of certain work carried out in East Africa is indicated. It is noted how the Schaudinn theory of "parthenogenesis" demonstrates the easy passage from pure speculation, through probable hypothesis, to certain observation ; and all without a particle of added proof.

vii. A varied attack with intravenous salvarsan, methylene blue capsules, and intramuscular quinine each repeated on its own due day is advised to overcome quinine resistance. The writer's conception of this condition is not indicated.

viii. Daily administration of 8 to 10 gm. of powdered bark of *Cinchona calisaya* was followed by improvement in 2 cases in which malaria parasites were not found in the blood and in which quinine had failed.

ix. The action of malaria on general paralysis is held to be non-specific.

C. L.

AKIYOSHI (T.). **Ueber Malariabehandlung der Syphilis.**—*Japan. Jl. Dermat. & Urol.* 1924. Sept. Vol. 24. No. 9. pp. 63–69.

BALFOUR (Andrew). **Historical Aspects of Malaria.**—Royal Institution of Great Britain. Weekly Evening Meeting, Friday, May 23, 1924. 13 pp.

VAN BODEGOM (J. L.). **Malaria en tegelijk paratyphus B.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Dec. 27. Vol. 68. 2nd Half. No. 26. pp. 3251–3252. With 1 chart in text.

CHARRIER (H.). **Le Paludisme dans la région de Tanger (Maroc).**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 355–360. With 1 fig.

DONNER (S.). [**Malarial Treatment of Progressive Paralysis.**]—*Finska Lakaresallskapets Handlingar.* 1925. Jan. p. 8. [Summarized in *Brit. Med. Jl.* (Epitome of Current Med. Literature.) 1925. Mar. 14. p. 49.]

FREIFELD (E. I.). **Microscopical Changes in Brain in Malaria Cases.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 1. In Russian pp. 1–8. With 4 figs. With English summary.

GERSTMANN (Josef). **Ueber die Malariaimpfbehandlung der progressiven Paralyse.**—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 1-2. pp. 2–10.

HERRMANN (G.). **Ueber die Malariabehandlung der juvenilen Paralyse.**—*Med. Klin.* 1924. June 1. Vol. 20. No. 22. pp. 745–746. With 1 fig. [1 ref.]

HUYSSEN (Carlos W.) & BUENDIA (Rogelio). **Errores de diagnóstico en las formas atipicas del paludismo.**—*Siglo Med.* 1924. Dec. 13. Year 71. Vol. 74. No. 3705. pp. 577–578.

KUSCHEW (N. E.). **Die Geschichte der Malaria.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 1. In Russian pp. 9–14. With German summary.

LEWIS (Nolan D. C.), HUBBARD (Lois D.) & DYAR (Edna G.). **The Malarial Treatment of Paretic Neurosyphilis.**—*Amer. Jl. Psychiatry.* Baltimore. 1924. Oct. Vol. 4. No. 2. pp. 175–221. With 22 figs. & 5 charts in text. [67 refs.]

LUKOWA (A. I). **Veränderungen der Venen bei intravenösen Chinineinspritzungen.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 3. In Russian pp. 16–20. With German summary

MACBRIDE (Henry J.) & TEMPLETON (W. L.). **The Treatment of General Paralysis of the Insane by Malaria.**—*Jl. Neurol. & Psychopathology.* 1924. May. Vol. 5. No. 17. pp. 13–27. [15 refs.]

MCGRATH (W. M.). **Malarial Therapy in General Paralysis of the Insane. The Disappearance of Gastric Crises as one of the Results.**—*Lancet.* 1924. Nov. 8. pp. 960–961.

MANDRU (V.). **Contribution à la prophylaxie du paludisme.**—*Paris Méd.* 1924. Feb. 23. Vol. 14. No. 8. pp. 181–182.

MAXCY (K. F.). **Mortality from Malaria, 1919-1923.**—*Public Health Rep.* 1924. Oct. 10. Vol. 39. No. 41. pp 2559–2561. [1 ref.]

MOLL (J. Marius). **Malaria Treatment of Progressive Paresis (G.P.I.).**—*S. African Med. Rec.* 1924. June 28. Vol. 22. No. 12. pp. 288–289.

SALAZAR (Martin). **Tratamiento de la paralisis general por la inoculación artificial del paludismo.**—*Siglo Med.* 1924. June 7. Year 71. Vol. 73. No. 3678. pp. 561–562.

SALKIND (E.). **[Erkrankungen des Nervensystems und Geistesstörungen bei Malariakranken in Dagestan.]**—*Jugo-wostotchni Westnik Sdrawochranenia.* 1923. No. 12. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Mar. 1. Vol. 29. No. 3. pp. 143–144.]

SEGUIN (T.). **A propos du traitement du paludisme.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 874–875. [1 ref.]

VALENTI (Adriano). **China-alcaloidi della china e malaria.**—*Policlinico.* Sez. Prat. 1925. Mar. 9. Vol. 32. No. 10. pp. 341–344.

WALRAVENS (P.). **Index paludique et quininisation des réservoirs de virus.**—*Bull. Méd. du Katanga.* 1924. Aug. Vol. 1. No. 4. pp. 123–127.

BLACKWATER FEVER.

THOMSON (John Gordon). **Researches on Blackwater Fever in Southern Rhodesia.**—*London School of Tropical Medicine. Research Memoir Series.* 1924. Vol. 6. pp. vii+149. With 12 charts, 10 plates & 1 map.

Dr. A. M. FLEMING visited the London School of Tropical Medicine and made arrangements whereby the administration of Southern Rhodesia should employ the services of medical men in research in tropical diseases. The Government of Rhodesia undertook to supply the funds for this work, and, it having been decided that blackwater fever was the subject of greatest importance to the territory, the author visited Rhodesia in 1922 and 1923 for the purpose of investigating this disease.

The report gives an admirable account of the present state of knowledge regarding blackwater fever, and although it perhaps does not throw much new light on the subject, will nevertheless prove of greatest value to those who have to deal with this dread disease, and will form an excellent basis for future investigation. If it has any defect, it is that it is not always quite easy to be certain whether the author is referring to his own observations or quoting from those of previous workers.

The matter dealt with in certain portions of this report, notably that referring to the relationship between blackwater fever and malignant tertian malaria, and that dealing with the question of pseudo-spirochaetes in the blood of blackwater fever patients, has already been published elsewhere and has been noticed in this *Bulletin* (see Vol. 21, p. 64, p. 385, and p. 804).

The second chapter is devoted to an account of the geography of Southern Rhodesia, the hydrographic and meteorological conditions met with, and the distribution of the disease in that country and throughout the world. In the next chapter a brief historical account of the disease is given and of the history of quinine in malaria and blackwater. Chapter 4 is concerned with the important question of the correlation of malaria and blackwater fever, and the following chapter with the malarial parasites found in blackwater fever. In Chapter 7 the question of haemolysis in general and especially in blackwater fever is discussed at length. A summary of previous work is given, and the author states that he was able to confirm the observation of earlier investigators that in blackwater there is no detectable autolysin comparable to that which is so readily demonstrable in paroxysmal haemoglobinuria. He notes, however, that successful cultures were obtained of the asexual cycle of 18 cases of *P. falciparum*, and on 5 occasions in which no development took place haemolysis was observed; there was no bacterial contamination, and it was found that if the blood was drawn at a period corresponding to schizogony in the body haemolysis invariably took place in the tubes. It is suggested that by cultural methods and the use of careful technique and controls it may be possible to demonstrate haemolysis at certain stages of the asexual cycle, *e.g.*, during schizogony.

In the next chapter the changes in the blood and the pathological lesions in the tissues are described. The organs most affected are the kidneys, liver, heart and spleen. Nearly the whole of the specialized epithelium of the kidney is destroyed, and the liver is also severely damaged, so that one could expect to find a slight degree of haemo-hepatogenous jaundice. Malaria pigment when present was noted most in the endothelial cells of the spleen pulp, and it also occurred in the endothelium of the glomeruli and hepatic capillaries.

Chapters 8 and 9 are concerned with the—from the pathological point of view—very important questions of haemoglobinaemia and jaundice. They give a summary of previous work, but, unfortunately, things are left in their previous unsatisfactory state. The author briefly records that his observations show that haemoglobinaemia precedes haemoglobinuria, and that in cases where it cannot be detected it has been missed owing to its rapid elimination from the serum. [Probably this is correct, but it undoubtedly requires proof; one of the most striking problems about blackwater fever is the relatively small degree of haemoglobinaemia which is found, as compared with that in such diseases as paroxysmal haemoglobinuria and those due to piroplasma infections.] A true jaundice developed in a large number of the Rhodesian cases within the first 12 to 15 hours and varied greatly in intensity. In three cases it was intense a few hours after onset, and was as severe as an acute obstructive jaundice. All cases of severe jaundice seen by the author were fatal: the gall bladder in the five fatal cases was distended with thick bile and the colour of the liver in section varied from yellow to dark bronze.

The following chapter is devoted to the urine, but here again the author contents himself with little else than a summary of previous work. Chapters 11 and 12 deal respectively with symptomatology and treatment and prophylaxis, and the next chapter consists of a number of conclusions, which are as follows.—

"(1) From an examination of the literature on blackwater and my own observations in Rhodesia I have come to the conclusion that the disease is due to repeated attacks of *P. falciparum*.

"(2) Observations on the haemolytic problem show that the condition strongly resembles the phenomena produced by the action of a specific serum haemolysin, and the altered chemical composition of the red cells as seen in infections with *P. falciparum* in Rhodesia suggest the mode by which a specific autolytic substance is produced. This haemolytic amboceptor would tend to act only on cells so altered.

"(3) From the above conclusions it is suggested that further research be instigated with a view to finding a specific anti-haemolytic serum, which could be administered to patients in whom the haemolytic mechanism was suspected.

"(4) The prevention of malaria will eradicate blackwater fever.

"(5) There is no evidence that any other specific organism is the causal factor of this condition, but these may act as exciting factors of the actual onset.

"(6) Quinine, as I have indicated, is the most valuable drug in its prevention, but unfortunately it is seldom used properly, and so has fallen into disrepute.

"(7) Treatment is symptomatic.

"(8) Finally, as we know the hygienic measures necessary for the prevention of malaria, there is no reason why blackwater should not be stamped out of those areas where it is endemic."

[The volume, which closes with a very complete Bibliography, is beautifully printed and illustrated, and as stated above, cannot fail to be of great value to all who are called upon to deal with blackwater fever. The disease is one of wide distribution, and greatly dreaded on account of the severity of its symptoms, its prolonged convalescence, and its relatively high mortality. As Thomson has shown, the literature relating to the subject, which goes back to the middle of the last century, is of a most voluminous character, and yet present knowledge of many aspects of the subject is most unsatisfactory. It is to be hoped that this excellent statement of the present position of things will call forth further efforts to elucidate the pathological processes occurring in one of the most important of exotic diseases.]

W. Yorke.

NOCHT (B.) & KESSLER (A.). **Zur Frage des Schwarzwasserfiebers.** [On the Question of Blackwater Fever.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Oct. Vol. 28. No. 10. pp. 443–453. [5 refs.]

The authors endeavoured to ascertain whether the watery extract of spleen, liver and kidneys removed aseptically from a case of blackwater fever immediately after death, added to various amounts of quinine either with or without carbonic acid, had any effect on human red cells, and whether any difference was to be observed in this respect between the organs from the case of blackwater fever and those from other corpses.

RUSNIAK* has shown that by the addition of a small quantity of quinine the carbonic acid haemolysis is expedited, and that the protective action of serum or of hypertonic saline in carbonic acid haemolysis is annulled. RUSNIAK considers that possibly a local circulatory disturbance in the internal organs, with a resulting increase of carbonic acid, causes, in the presence of quinine in sufficient concentration, haemolysis and an attack of blackwater.

The authors' experiments were conducted first at room temperature, and then at 37° C. The quinine solution used consisted of 2·5 gm. of quinine hydrochloride in 300 cc. of physiological saline and in a table the concentration of quinine obtained by adding 1 drop, 2 drops, 3 drops, etc., of this solution to 1 cc. of serum is shown. The red cells for investigation were obtained by means of centrifuging and washing 5 times in normal saline; the organ extracts were made by grinding up pieces of the freshly removed organs in clean sterile sand with twice the volume of sterile saline, the material then being passed through a coarse sterile filter.

Two series of experiments were performed, the one with CO_2 and the second without it. In the CO_2 series the serum was first saturated with the gas and then the mixture made and the tubes placed in a desiccator and allowed to stand in an atmosphere of CO_2 for a quarter of an hour. The various constituents were added to the tube as follows: (1) Serum; (2) extract; (3) red cells; (4) quinine solution. As but little haemolysis occurred at laboratory temperatures all later experiments were conducted at 37° C. The results are given in a series of tables.

The following are the conclusions:—

1. At room temperature slight haemolysis after more than 6 hours was noted with a concentration of quinine of 1 : 485 in the presence of CO_2. Blackwater fever extracts inhibited this feeble haemolysis.
2. In CO_2-free conditions no haemolysis was noted at 37° C. after 6 hours; on the following day haemolysis was noted in extract-free tubes with quinine concentration of 1 : 1,229, and in tubes containing liver extract and kidney extract with quinine concentration of 1 : 787.

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* Chinin und Blut. *Biochemische Zeitschr.* 1920. Vol. 104, p. 13, and Vol. 105, p. 117.

3. The blackwater fever spleen extract is exceptional. It exhibits, as compared with the other organs and also with the organs of healthy individuals, a striking behaviour in that it inhibits haemolysis with the higher quinine concentration. A definite distinction was not observed whether CO_2 was present or absent.
4. Carbonic acid does not assist quinine haemolysis.
5. Serum exerts a strongly inhibiting action to the haemolysis.
6. Especially striking is the inhibiting effect of icteric serum.
7. The most easily lysed erythrocytes were those from a patient suffering from *P. falciparum*, whilst those from a case of tertian malaria exhibited no peculiarity.
8. The anti-haemolysing action of small amounts of quinine noted by SCHNABEL was also observed in these experiments.

W. Y.

SCHILLING (Viktor) & JOSSMANN. **Ein Fall von Schwarzwasserfieber nach Impftertiana bei Paralyse.** [A Case of Blackwater Fever after Inoculation of Tertian Malaria in General Paralysis.]—*Klin. Woch.* 1924. Aug. 12. Vol. 3. No. 33. pp. 1498–1499. With 1 fig. [3 refs.]

Details are given of a case of general paralysis which developed blackwater fever after inoculation with simple tertian malaria. The patient is 25 years of age and contracted syphilis in 1912. Since 1918 he has exhibited symptoms of general paralysis, and the Wassermann reaction was strongly positive on 22nd February, 1924. On 13th March, 1924, he was inoculated intravenously with simple tertian blood from another case of general paralysis. The strain was originally obtained from a naturally infected case in the Balkans and has been used for about 100 general paralytics; it was a pure infection of *P. vivax* and had never given rise to any particularly virulent infection. The incubation was short, and the patient was allowed to have 16 rises of temperature as he stood the attacks well; he was then given on 2nd April two teaspoonsful of *Neopanchinal* daily (a total extract of cinchona bark prepared by Schmitz of Breslau; the dose contains about ·25 gm. of pure quinine). The temperature fell to normal the following day and parasites had disappeared from the blood. The drug was continued twice daily until 5th April, after which it was given once daily until 9th April, when, owing to signs of heart weakness, caffeine, digitalis and camphor were given. On 10th April, as it was considered that possibly the malaria was not cured, quinine hydrochloride was given in doses of ·5 gm. twice daily. Blackwater fever set in the same afternoon. The attack was mild and the patient recovered.

W. Y.

REZNIK (J.). **Hémoglobinurie et sérum antivenimeux.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 179–180.

Details are given regarding the treatment of blackwater fever in two young Portuguese by intravenous injections of antivenomous serum. The first case was given 10 cc. of the serum and 1½ hours later the urine was perfectly clear and the patient recovered; the second case was also given 10 cc. of the serum and the urine half an hour later was perfectly clear; he had a slight relapse the next day and was given another 10 cc. of the serum and an hour later the urine was clear.

The author writes that it is very difficult to draw definite conclusions from two observations; he can only state that the treatment was very favourable. [It is, of course, impossible to state that the injections had no effect on the course of events, but it is abundantly clear that the author has not the slightest ground for claiming anything from the facts as presented in his paper.]

W. Y.

DE ROOK (H.). **Nadere beschouwingen over Zwartwaterkoorts. (Uit de geneeskundige verslagen der wetenschappelijke Central-Guinea-expeditie 1920-1922.)** [Some more Remarks on Blackwater Fever. (From the Medical Reports of the Scientific Central New Guinea Expedition, 1920-1921.)]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 632-641.

De Rook saw 40 cases of blackwater fever during the expedition, three ending fatally; the shortest term between arrival in the malaria district and the outbreak was four months. The author ascribes this to the great density of malarial infection and to unavoidable difficulties in the administration of quinine. All the patients had suffered from malaria and were insufficiently treated; in 8 cases occurring in patients still in hospital the presence of Plasmodia in the blood was demonstrated. De Rook advises not to give quinine during the attack unless the fever is very persistent. In such cases it should be administered refracta dosi.

W. J. Bais.

THOMSON (J. G.). **Preliminary Report on the Results of Investigations into the Causation of Blackwater Fever in Southern Rhodesia. Presented to the Legislative Council, 1923.**—*Jl. Roy. Army Med. Corps.* 1924. Nov. Vol. 43. No. 5. pp. 376-377.

JACKSON (O. E.). **"Blackwater Fever."**—*S. African Med. Rec.* 1924. June 28 Vol. 22. No. 12. pp. 273-286. [10 refs.]

REVIEWS AND NOTICES.

HAUGHWOUT (Frank G.) [Protozoologist, Bureau of Science, Manila, P.I.]. **The Practical Microscopic Diagnosis of Dysentery.**—*Bulletins from the Inst. for Med. Res., Federated Malay States.* 1924. No. 3. 130 pp. With frontispiece, 20 plates and 7 text figs.

Clinicians and pathologists, especially in those areas where dysentery is endemic and epidemic, will find this monograph of the greatest practical use in assisting them to arrive at a diagnosis, both in the case of the true dysenteries and also in conditions which may simulate them. The cytological pictures of the various intestinal conditions are dealt with in detail, and the author has employed as amplification of his descriptions numerous text figures and photo-micrographs. The microscopic appearance of bacillary, amoebic and balantidial dysenteries are discussed, and are compared with the exudates due to other intestinal inflammatory causes.

The basis of this publication is the original observations of WILLMORE and SHEARMAN (1918), who pointed out that in acute bacillary dysentery the cell picture under the microscope was characteristic, and of great value in the rapid diagnosis of cases urgently requiring treatment. During the Great War, especially in the Near East, it was the custom in many laboratories to report the cytological findings at once to the clinicians, who, correlating this with the clinical aspect of the case, were able to start the necessary treatment, thus avoiding the vexatious delay in waiting for a bacteriological report regarding the type of organism isolated from the faeces.

Sections of the book are devoted to the technique of faecal examinations, to the pathology of the dysenteries and the association of the pathology with the cellular exudate in the faeces, and to a well illustrated analysis of the various important cells. For ready reference the author has summarized in a table at the end of the book the chief points which have been dealt with, but he emphasizes the importance of using this only after a careful study of the publication as a whole, and even then it should be used in association with the appropriate sections of the text.

The most important features in the differentiation of cell exudates in various intestinal infections may be briefly stated as follows: (1) In acute bacillary dysentery the cellular exudate is characteristic of that condition and of no other intestinal disorder. Phagocytic endothelial macrophages are considered as pathognomonic, while polymorphonuclear cells with fatty inclusions and annular degeneration of the nuclei predominate, forming about 90 per cent. of the cells present. Marked toxic necrosis is seen in many cells. (2) In intestinal exudates due to bacterial inflammatory conditions other than the true bacillary dysenteric group, *e.g.*, abscess formation, septic processes of the gut due to broken down haemorrhoids, fistula, etc., or resulting from the effects of such irritant poisons as mercury or arsenic, endothelial macrophages and ghost cells are rare or absent. Polymorphonuclears (pus cells) predominate, but usually the cytoplasm is intact. (3) Ghost cells and endothelial macrophages are absent in acute amoebic dysentery and balantidiasis. Polymorphonuclear leucocytes are variable in number, but do not form a dominant feature of the picture. The diagnosis of these two diseases ought to be made by finding *Entamoeba histolytica* and *Balantidium coli* respectively, and the proportion of polymorphonuclears present can be used as a rough index of the extent of accompanying bacterial invasion.

J. G. Thomson.

REVISTA MÉDICA DE ANGOLA. **Número especial consagrado ao Primeiro Congresso de Medicina Tropical da Africá Ocidental.** No. 4. [Vols. 1–5.]—Agosto de 1923. [Lisbon: Repartição de Saude do Ministério das Colónias.]

This Report of the Congress of Tropical Medicine held at Loanda in 1923 occupies five volumes, and an aggregate of over 2,000 pages. The Congress, which appears to have been well organized, was attended by delegates from Angola, Belgian Congo, France and the French possessions in Equatorial and West Africa, Great Britain, Mozambique, Nigeria, Portugal and Portuguese India, St. Thomé, and the Union of South Africa; it included altogether 76 participants, and held ten sessions. The subjects discussed were very comprehensive in their range and included all the classical "tropical" diseases, besides eye diseases, rabies, smallpox and vaccination, surgery of elephantiasis, syphilis and venereal prophylaxis, tuberculosis, and a number of miscellaneous subjects, such as intestinal parasites, skin parasites, drugs and indigenous poisons, climate, meteorology, anthropology and ethnology. Public Health and Sanitation received a large share of attention and were discussed under the headings of hospitals and hospital administration, maternity and infant welfare, preventive measures, sanitary organization, sanatoria general and special, and social hygiene. The papers and discussions are published in extenso, and the more important of them have been or are yet to be individually noticed in the *Bulletin*.

A. Alcock.

Proceedings of the International Conference on Health Problems in Tropical America held at Kingston, Jamaica, B.W.I., July 22 to August 1, 1924 by invitation of the Medical Department United Fruit Company.—pp. xxi + 1010. With 16 plates (5 in colour), various figs and charts. 1924. Published by United Fruit Company, Boston, Massachusetts.

This volume records the proceedings of the Conference on Health Problems in Tropical America held at Kingston, in Jamaica, by invitation of the Medical Department of the United Fruit Company—a conference sustained by 62 participants, including some of the leaders of medical research, some of the most distinguished exponents of modern sanitary doctrines, and representatives of numerous institutions, services, and official departments in America and Europe. In his opening address Dr. DEEKS, the General Manager of the Medical Department, in stating that the object of the Conference was to get guidance, compared the inhibited development of tropical countries caused by the prevalence of tropical diseases in their ports to the effects exercised by a naval blockade upon a belligerent. He also referred to the increasing cultivated acreage in tracts recently uninhabited that has followed the application of modern knowledge of tropical diseases, and expressed his conviction that the current of immigration will set towards the tropics when those diseases have been brought fully under control. Seventy papers discussed at the Conference are published in this Report, and are already in course of notice in the appropriate sections of this *Bulletin*.

It is long since Napoleon taught that an unhealthy military site is worse than the bloodiest battle, and the United Fruit Company has been one of the first chieftains of industry to realize, conversely, the economic value to a site of an efficient medical department. It is hardly an exaggeration to say that this handsome achievement by a mercantile corporation of a conference to discuss the principles of preventive medicine in tropical countries inaugurates a new era—none the less truly humane for not being avowedly humanitarian.

A. Alcock.

CAWSTON (F. Gordon.). **"Bilharzia," a Paper for the Practitioner.** [Reprinted from the *Jl. Trop. Med. & Hyg.*]—20 pp. 1925. London: John Bale, Sons & Danielson, Ltd., 83-91, Great Titchfield Street, W. [Price 2s. 6d. net.]

This booklet deals with the chronic haematuria of schistosome origin that occurs, particularly among children of school age, in certain parts of South Africa, especially along the Natal coast. The ova, as found in the urine, the intermediate molluscan host, and the cercaria are briefly characterized; the signs and symptoms of the human infection are depicted; and the treatment by intravenous injection of tartar emetic and the precautions to be adopted and the management of attendant risks are very fully described.

A. Alcock.

CALMETTE (A.) [S.-Directeur de l'Institut Pasteur], NÈGRE (L.) & BOQUET (A.) [Chefs de Laboratoire à l'Institut Pasteur]. **Manuel technique de microbiologie et sérologie.**—568 pp. With 14 figs & 3 plates in colour. 1925. Paris: Masson et Cie., 120 Boulevard Saint-Germain. [Price 35 fr.]

The Institut Pasteur of Paris is the Mecca of bacteriology, and all bacteriologists will give a cordial reception to a technical manual which embraces the manifold experience accumulated since the science had its birth. This volume appears under the distinguished names of Calmette, Nègre, and Boquet. It is, as is emphasized in the preface, not a treatise nor a course on microbiology. It is not addressed to "débutants" but only to those who already have some experience in laboratory manipulations. It is intended to lie on the table of the research worker, so that he may have at his hand a friend and a guide whom he may consult during the course of his daily work. The whole technique of microbiology and serology is covered in its various chapters, and this, with a fullness of detail and a clarity of exposition for which the French school is justifiably famous. It is impossible in a review to deal with the subject matter of a book of this sort in detail; it is only possible to draw attention to certain points which interest the reviewer. In the majority of manuals the usual tendency is for the author to confine himself to such organisms as are cognate to his own province, be it medicine or agriculture. In this volume a table of the principal biological characteristics—motility, sugar reactions, etc.—of many hundreds of the more common bacteria is included. This will be of great service, as it describes, for example, such features as the type of animal for which the bacterium in question is pathogenic. In addition to this, separate tables for differentiating particular groups of pathogenic organisms are included. The chapters devoted to serology are very complete, and the technique of each reaction is given in detail. A further chapter is devoted to the determination of the activity of the principal diastases. The subject matter is thoroughly up to date. The volume should be in the hands of all laboratory workers.

A. G. McKendrick.

BOTREAU-ROUSSEL. [Médecin-Major de 1re Classe des Troupes Coloniales.] **Ostéites pianiques "Goundou."**—pp. iv.+132. With 89 figs. 1925. (Collection de la Société de Pathologie Exotique.) Paris: Masson et Cie., 120 Boulevard Saint-Germain. [Price 16 fr.]

There are more fish in the sea than ever came out of it! The monograph under review is an excellent example of this saying as applied to tropical medicine. The author, during four years spent on the Ivory Coast, saw only one case of goundou; then, in August, 1916, two other cases presented themselves for treatment within a few days of each other. Removal of the tumours was done in each case. The success of this treatment was soon rumoured far and wide, and other cases started coming in to submit to surgical intervention, with the result that during the last twelve months Dr. Botreau-Roussel was there he saw 130 cases of goundou, and operated on 113! These cases and subsequent pathological work on the material obtained form the subject matter of this monograph, which is without doubt perhaps the most important contribution to the subject of goundou, and incidentally one of the most important contributions to yaws.

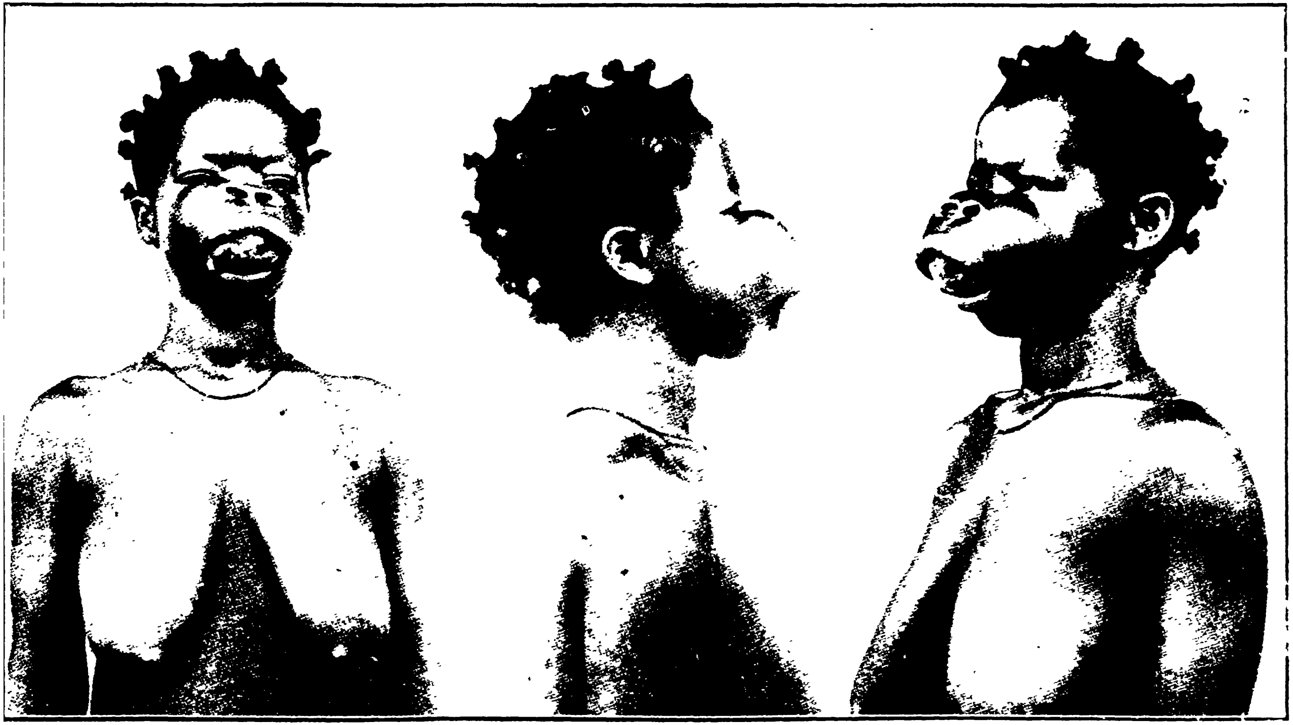
The first chapter recapitulates what was already known about this affection and its geographical distribution, and reference is made to the ancient Inca skull from Peru described by LETULLE, which shows the characteristic lesions of goundou. Mention is also made of the goundou-like affection reported in monkeys. The bony lesions under consideration—goundou and osteitis elsewhere—were often associated and appear definitely connected with yaws. Goundou was observed in an early stage during the eruptive stage of yaws in one case; in a later stage of evolution some years after the secondary yaws eruption, 79 cases; in an arrested stage late after yaws, 49 cases—giving a total of 130 cases. The history of each case was taken with care and the following facts were elicited: The lesion appeared during the eruptive stage of yaws in 64 cases; shortly afterwards in 34 cases; long afterwards in 5 cases; no history obtained, 25 cases; yaws denied but attempts to inoculate with yaws failed, 2 cases. Again, 48 showed paranasal tumours only; 65 showed lesions of other bones; in 10 paranasal tumours were absent or secondary to bony tumours of some other part of the face; in 7 others there was osteitis of long bones of limbs without affection of bones of the face.

The localization of bony lesions was as follows:—

Paranasal, unilateral,	13	121	Tibia	69
bilateral ...	108		Fibula	5
			Femur	4
Superior maxilla (not above included)	23		Ulnar and radius	5
Mandible	16		Clavicle	3
Malar	1		Humerus...	2
Cranium	2		Phalanges	1

It must be remembered in regard to this table that the majority of patients came under observation for the specific purpose of having the paranasal tumours removed, and therefore it does not give probably a correct idea of the relative frequency with which the various bones are affected.

There follow accounts of a number of examples of the condition with a wonderful and unique series of photographs. Among these is one of an infant aged 18 months which was brought by its mother on account of a yaws eruption and for pain which the child appeared to suffer day and night. Two weeks later a swelling on each side of the nose was observed, which four weeks later presented the typical characters of goundou. Swellings also showed on the anterior surfaces of each tibia and at the lower ends of the radii. A 10 cgm. dose of N.A.B. was then administered, and repeated three times at 10-day intervals, by which time all signs and symptoms had disappeared. In a second case, a boy aged 8 years, a widespread osteitis developed at the moment when the yaws rash disappeared, and when seen a year later the radius, ulnar, phalanges, humerus, femur, tibia and fibula on each side and the lower jaw were affected. After 4 injections of N.A.B. improvement set in and all pain disappeared, and though the swellings had diminished in size they had not entirely disappeared. A third case resembles the second plus paranasal tumours, these signs developing in a boy, now about 16 years old, when he was suffering from yaws at 2½ years of age.



Bossoma Abra: An extreme case of goundou in which the superior maxilla is entirely involved and forms an enormous mass protruding from the mouth.

[Reproduced from Botreau-Roussel: Ostéites pianiques "Goundou." (Masson et Cie.).]

In the cases described under the heading of osteitis of long bones without face lesions we recognize the lesions usually ascribed to yaws by other writers. In only a single case was any condition resembling dactylitis seen. It is interesting to note that among these and many other cases a general adenopathy was noticed, the epitrochlear glands being particularly mentioned (a sign almost diagnostic of syphilis in this country). Another group of cases deserving of mention are those presenting face lesions which are not typical of the classical description of goundou—a horse-shoe form encircling the bridge of the nose, small tumours on the superior process of the maxilla and external part of the malar bone on each side, tumour the size of a man's fist involving the body of the maxilla on each side, a tumour of the mandible, the two latter accompanied by typical goundou tumours. In some the growth encroaches upon the nasal and buccal cavities, and the extreme case of Bossoma Abra is here reproduced.

Chapter III deals with pathogeny. The old theory of intranasal infection is discarded. Syphilis the author excludes by history, except in one case, who contracted the disease 15 years after suffering from yaws and 8 years after the development of goundou. At the same time, it is conceded that the evolution of the osteitis as he has seen it in his patients resembles exactly that seen in congenital syphilis, excepting only the paranasal tumours which have never been described in that disease unless Leontiasis ossea be so considered. ANTONELLI believes this disease to be a rare manifestation of syphilis The author reminds us that when FRIEDRICHSEN and FISH wrote that syphilis was common on the Gold Coast where goundou was also found, yaws was considered to be a symptom of syphilis, and that it was yaws that was being observed. He believes that the association of goundou and other forms of osteitis is indisputable, and refers to the infant case above mentioned and the figures quoted earlier in this review. Reference is made to SCHÜFFNER's work in showing that all serum reactions are useless in differential diagnosis.

Twenty-eight cases of the total 130 which showed considerable glandular enlargement were subjected to gland puncture and the juices examined, all with negative result. The author points out that his cases were drawn from among the uncleanly raw natives of the forest area, away from the sea coast, where yaws is common and where he believes it occurs in virulent form and accounts for many deaths among the children, although this is not borne out in the family histories of his cases.

Many interesting facts are given illustrating the rate of growth of the paranasal tumours, which in many cases lead to blindness. Except for the bony deformations other " tertiary " manifestations were not observed, probably owing to the fact that the actual endemic area of yaws was far distant. The pathological findings are fully dealt with and should be read by all those interested in goundou. The characters of the generalized osteitis as found in a single case which died under anaesthetic are also described. The skeleton of this case is preserved at the Musée Dupuytren in Paris. It shows no affection of the cranium, orbits, malar bones or zygoma, but there are present large paranasal tumours together with a general diffuse hyperostosis of the anterior part of the maxilla ; the mandible shows a similar condition affecting the anterior half on each side. The clavicles, scapulae, ribs, sternum and pelvis appear normal, but the bones of the carpus and tarsus together with the long bones of hands, feet and upper and lower extremities are all the seat of a hypertrophic osteitis with thickened and adherent periosteum. This skeleton resembles a second skeleton of unknown origin in the Museum labelled Leontiasis ossea except that in the latter the cranium is affected. The resemblance of the case to one of Paget's disease is also remarked, and the fact that this disease has been considered as a manifestation of syphilis is pointed out. No mention is made of juxta-articular nodules.

H. S. Stannus.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 6

TUBERCULOSIS IN THE TROPICS.

FOWLER (James K.). **Tuberculosis in the Tropics.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 796–805. [8 refs.] [United Fruit Company, Boston, Mass.]

——. **Extracts from the Second Section of the Address on Tuberculosis in the Tropics.**—*Ibid.* pp. 806–814.

Few have had a wider experience of tuberculosis as seen in an industrialized community than Sir James Kingston Fowler, and we turn with interest to his views on tuberculosis in the tropics. We find, however, that his remarks bear, for the most part, upon the part of tuberculosis work with which he has the greatest personal familiarity and that his paper deals to a large extent with the problems of the disease in Western Europe.

Sir James rightly states that "obsolete lesions" are seldom found in negroes. This is in accord with the experience of nearly all observers and represents a fact of great importance in relation to epidemiology, especially if taken in conjunction with the extreme susceptibility of the primitive African native to tuberculosis. As Fowler points out, "the evidence is overwhelming that when tuberculosis is introduced into a country formerly free from it, the natives manifest a degree of resisting power much inferior to that shown by inhabitants of countries in which it has been present for countless generations." This is illustrated by a table of the incidence of and mortality from tuberculosis among the native and British troops in France in 1918 in which South African Native Corps was shown to have an annual case incidence of 186 and an annual mortality of 167 per 10,000 of active strength, while the British troops had an incidence of 10 and a mortality of 0·5 per 10,000 in the same period.*

Sir James Fowler, in discussing this extreme susceptibility of primitive races to tuberculosis, is inclined to attribute it to hereditary factors rather than to lack of acquired resistance. He has little hope for the success of efforts aimed at raising the resistance of susceptible persons by immunization and considers that "vaccinating doses of dead or attenuated tubercle bacilli" are unlikely to be the means of producing an A 1 population. "I should rather," he says, "strive in every possible way to improve the physique of the nation and thus to increase the resisting power of the people to disease, including tuberculosis."

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* It may be pointed out that the footnote reference to these figures attributing them to a paper by CUMMINS in the *Trans. Soc. Trop. Med.* in June, 1912, is incorrect. The figures appeared in a paper by that author in the *International Journal of Public Health,* in 1920 (see this *Bulletin,* Vol. 18, p. 62).

[The only A 1 population ever seen by the reviewer was the Dinka population in 1902, a population living the life of hunters and warriors, where every adult male appeared a perfect physical type, where the food was what nature intended it to be, neither tinned nor adulterated, and the housing extremely bad but ameliorated by the fact that life was spent out of doors. These A 1 men were susceptible to tuberculosis to a surprising degree in spite of their perfect general health. This susceptibility must, according to Sir James, have been a hereditary weakness of constitution ; but it is of interest to note that it co-existed with the ideal physique which is recommended as the goal of anti-tuberculosis effort.]

In the second section of his address on "Tuberculosis in the Tropics," Sir James outlines an organization based on a Tuberculosis Settlement on the lines of the Papworth Industrial Colony together with notification of cases and such valuable adjuncts as After-Care Committees and Local Tuberculosis Centres. His scheme is an excellent one, founded on long experience of tuberculosis in England and making ample provision for the needs of the European industrial worker whose earning capacity has been impaired and his competitive powers limited by tuberculosis. It would be an experiment of great interest to apply a scheme such as this in one of our Colonies or Dependencies, and there is little doubt that it would serve a good purpose. In applying it, those concerned would have to be on the alert to see in what directions it might require modification to meet local needs. It is probable, for instance, that the Hospital Department would prove to be a much more important element than the Sanatorium Department, in view of the greater number of acute and fatal cases. The Industries Department, too, would have to meet local industrial tendencies ; and might develop on lines not quite identical with the Papworth Industries.

At Papworth, as Sir James points out, the cottages are reserved for married men only ; but in India, for instance, they might have to house the whole group of dependents and relations forming the "family" of some unhappy Bengali clerk or minor official.

A list of six "Open secrets of the successful management of the industries of a Settlement" are given, and should be studied in the original by those about to organize a Settlement in the Tropics. Here we would venture to add a seventh—to the effect that the man in charge must have a close and sympathetic acquaintance with the manners, customs and feelings of the natives and that, in addition to a good knowledge of tuberculosis, he must be well versed in other tropical diseases. An "addendum" is given in which Sir James deals trenchantly with the diagnoses made by Officers of the Ministry of Pensions in dealing with "tuberculous" ex-soldiers. Here every word is worth close attention by students of tuberculosis in a European community, but the views enunciated as to fibroid phthisis and other chronic forms of the disease have but little bearing upon tropical tuberculosis.

S. L. Cummins.

CHARLES (Richard Havelock). **Tuberculosis in India.**—*Practitioner.* 1924. Dec. Vol. 113. No. 6. (No. 678). pp. 393-398.

Charles points out that in India tuberculosis is not a new disease, but that it appears to have increased considerably during the past forty years. The increase has been most marked in those centres which have shown the greatest commercial and educational development. It is of interest to note, also, that while the smaller towns and village districts had formerly but few cases, the disease has now spread widely in these places. The author correctly states that surgical tuberculosis, far from being infrequent in India, is very wide-spread amongst the natives of that country, a point of interest since bovine infection is almost unknown and milk is invariably boiled before use.

S. L. C.

ROGERS (Leonard). **Tuberculosis Incidence and Climate in India: Rainfall and Wet Winds.**—*Brit. Med. Jl.* 1925. Feb. 7. pp. 256-259. With 2 maps in text. [4 refs.]

In this remarkable paper Sir Leonard Rogers brings about a happy combination between his knowledge of a country in which he has passed the greater part of his professional life and his familiarity with the problems of tuberculosis. The result is a communication of exceptional interest, the main findings of which are illustrated in the maps which are here reproduced and which show, in graphic form, the incidence of tuberculosis *per mille* in the jail populations of various parts of India, the annual rainfall in inches, the absolute humidity at the height of the south-west monsoon, the barometric pressures and the force and direction of the monsoon winds.

It will be seen at once that very high rainfall corresponds roughly with a very high tuberculosis incidence, as in Bengal, where there are 13·7 cases *per mille* in the jails, with a fall of over 75 inches, and along the West Coast area, where the tuberculosis incidence is 10·9 *per mille* and the rainfall 100 inches annually.

Again, the Deccan, with a low rainfall of less than 30 inches a year, has the lowest tuberculosis incidence rate, only 2·7 cases *per mille.* But these correspondences are to some extent neutralized by definite exceptions, as in the case of central Madras with a tuberculosis incidence of 11·7 *per mille* and an annual rainfall of from 20 to 30 inches, or as in "area 12," including the Himalayan Hill stations, where the low tuberculosis incidence of 3·6 *per mille* goes with a high rainfall of about 50 inches. Rogers concludes, therefore, that there must be other factors at work, and turns to the barometric pressure and the direction and force of air currents as a possible line for investigation.

Here he finds a remarkably close correspondence between the prevalence of rain-bearing wind currents and tuberculosis, and sets forth a series of observations which would appear to lend strong support to those of W. GORDON (*Brit. Med. Jl.* 1924, Nov. 29, p. 983) based on a similar study in this country.

It is obvious that these correlations between climatic conditions and the incidence of diagnosed tuberculosis are of great interest and that they require to be further studied. It must be said, at the same time, that they require to be studied critically and that conclusions can only be drawn with great caution and with a full appreciation of the numerous sources of fallacy which have to be taken into account.

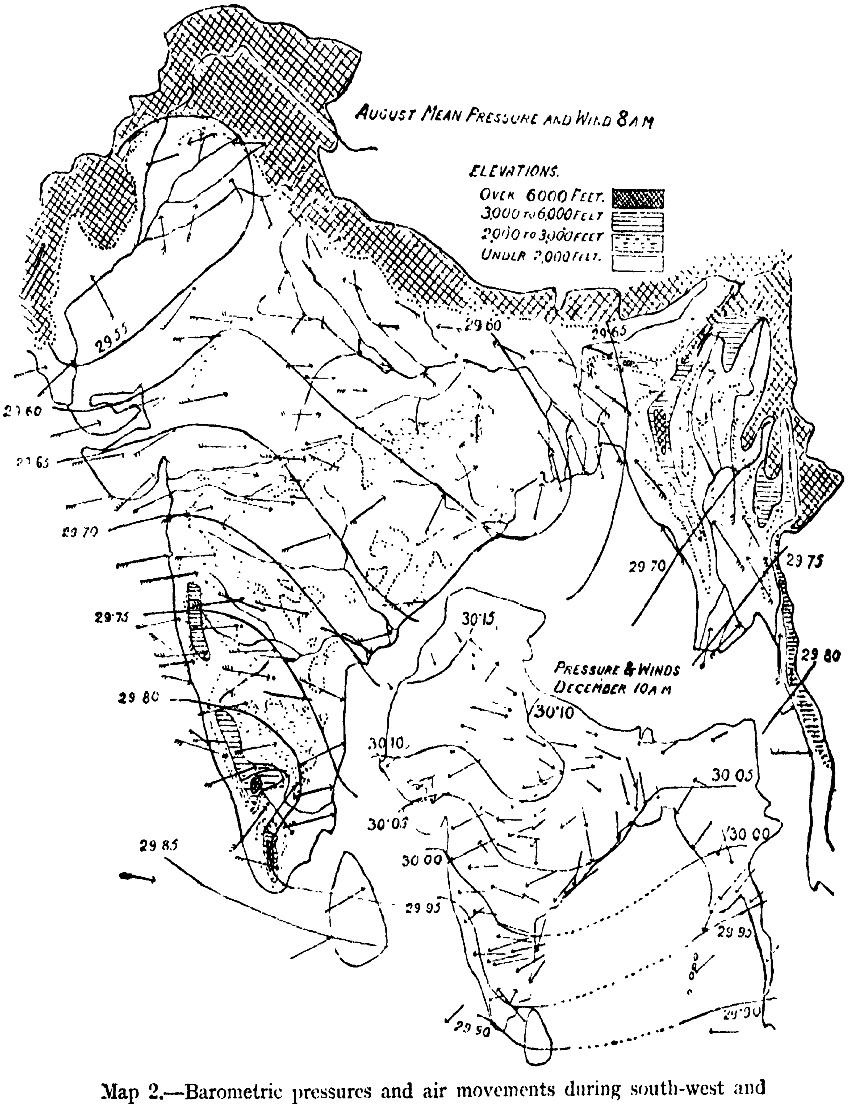
It will be conceded, for instance, that climatic factors cannot ***cause*** tuberculosis, although they may perhaps be of great importance in modifying the course of infection in persons already contaminated with the germ of the disease. To obtain the full significance from the meteorological facts and figures so carefully collected by Sir Leonard Rogers, it would be necessary to know the degree of tuberculization of the populations of the areas concerned as well as their relative density and their industrial conditions. It might be the case, for instance, that the jail population in Bengal included a

TUBERCULOSIS IN INDIA.

Areas and Rates per Mille of the Jail Population.

1.	Burma Coast	8·4
2.	Burma Inland	9·2
3.	Assam Valleys	4·5
4.	Bengal and Orissa ...	13·7
5.	Gangetic Plain and Chota Nagpur	7·3
6a.	E. Upper Sub-Himalayan	8·9
6b.	W. Upper Sub-Himalayan	8·2
7a.	N. Indus Valley	9·3
7b.	S. Indus Valley	6·2
8a.	Gujerat	6·9
8b.	Central India	5·9
9a.	Central Provinces ...	5·3
9b.	Deccan and Berar ...	2·7
10.	Western Coast	10·9
11a.	Central Madras	11·7
11b.	S.E. Madras	10·6
11c.	W.E. Madras	12·0
12.	Hills	3·6
13.	N.W. Frontier	4·3

relatively large number of previously infected persons likely to infect their fellows or to break down under the depression of incarceration and to develop diagnosable tuberculosis, while that of the jails in the Deccan might contain but few. It is here that we miss the splendid index to the distribution of infection provided by the systematic



Map 2.—Barometric pressures and air movements during south-west and north-west monsoons.

[Reproduced by permission from the *British Medical Journal.*]

tuberculin tests so thoroughly applied in the French colonies and so unhappily neglected in our own. But such an index is wanting in India, and our thanks are due to Sir Leonard Rogers for a study which makes the best possible use of the material available and brings many new and interesting facts to light.

S. L. C.

RAMSAY (G. C.). **Tuberculosis in Assam.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 14. p. 531.

Dr. Ramsay, discussing the statement of Sir Leonard ROGERS that the tuberculosis incidence is low in the jails of Assam although the rainfall is high, states that, in the Cachar district, rain-bearing winds and tuberculosis are both common.

In the past five years the deaths of persons diagnosed tuberculous on grounds of a positive sputum have amounted to 10 per cent. of the total mortality in a community of about 20,000 coolies; and it is probable that many cases escaped diagnosis through having no sputum or through no attempt having been made to find the bacillus. As the author points out, a tuberculosis death rate of 10 per cent. of the total death rate is very high in a community where pneumonia, dysentery, cholera, malaria and other acute diseases add to the general death rate.

The local tribes, Kukis, Lushais, Nagas, Manipuris and Cacharis, all suffer frequently from the disease. The clinical type prevalent in Cachar is represented by a diffuse, rapid, caseating, necrotic form of tuberculosis with rare haemoptysis; but all types, as seen in Britain, are to be met with from time to time with the single exception of lupus. This absence of lupus may, perhaps, be traced, according to the author, to the action of a tropical sun upon a bare-legged and ill-clad population. If this is the true explanation, it is strange that other forms of tuberculosis should be so little affected.

S. L. C.

ROY (Ashutosh). **Some Etiological Factors of Tuberculosis in India in General and Bengal in Particular.**—*Indian Med. Rec.* 1924. Nov. Vol. 44. No. 11. pp. 326–329.

This paper makes sad reading. It vibrates with the bitter cry of a people swept by the impact of an alien civilization into a mode of life for which they are unprepared and unsuited.

> "The over-population of towns, the depopulation of villages, the multiplication of mills and of factories, the decline of agriculture, the increased means of communication which are necessary corollaries to industrial development and increased trade, the unequal distribution of wealth, the increasing poverty of the dumb millions are well-known effects of the material civilization of the West grafted to our country and have given increased facilities for direct transmission of the disease. *Hence tuberculosis is considered as a disease associated with Western civilization.*"

The stress of adaptation to new industrial conditions has been severely felt even in Great Britain, and the almost epidemic wave of tuberculosis which characterized the early decades of the nineteenth century in England and the middle and later decades in Scotland, Wales and Ireland has afforded evidence as to the effect of fairly rapid urbanization upon a relatively agricultural population. But the steady increase of commerce following the prolonged naval supremacy of an island power had gone far to prepare the people of England for the industrial developments of applied science, and a few generations of town-dwelling sufficed to bring about adaptation to the new environment and to establish the widespread acquisition of a fair margin of immunity towards tuberculosis, a fact reflected in the rapid fall in the tuberculosis death rates from 1861 onwards.

In India, the rapid development of industry finds the population quite unprepared. The sudden change from village life to town life, the sudden transition from an existence guided by calm ritual to one of intellectual stress and economic competition, is sufficient, in itself, to explain the rapid extension of tuberculosis in Bengal, and throughout India generally; but when we add to this the retention of such social institutions as the Purdah system, child-marriage, the "joint family system," by which, perhaps, one underpaid Baboo is obliged to shoulder the financial burden of a host of relatives, we begin to see that the period of "adaptation," happily brief in this country, is likely to be more prolonged and more tragic in India, and that our "Raj" may well be faced with not altogether undeserved execration unless intelligent steps are taken to improve the situation. Are such steps still possible? Or is it already too late? The task of "prevention" in India promises to be no light one, since the problem depends so largely upon native customs which are quite beyond European control or modification. Dr. Roy concludes that "it is time to turn back to country life and avoid unnecessary luxuries." He is right; but can his advice be taken? "Back to plain living is the gist of Eastern civilization," he says, "and the soundest advice given by the greatest political thinker of modern India." India, like Europe, is "caught in the wheel of things." Civilization is a good servant, but a hard master. We can *look* back; but can we *go* back?

S. L. C.

Opie (Eugene L.). **Active and Latent Tuberculosis in the Negro Race.**—*Amer. Rev. of Tuberculosis.* 1924. Nov. Vol. 10. No. 3. pp. 265–274. With 1 plate & 1 text fig.

The paper, one of great importance and interest, is best appreciated if read in the light of Opie's previous work on pulmonary tuberculosis, and especially of a notable paper from his hand appearing in the same number of the *American Review of Tuberculosis* under the title of "Pathological Evidence of First Infection in Association with Active Pulmonary Tuberculosis." In describing the results of a long series of observations on human lungs studied, after removal post-mortem, both by radiological and pathological methods, Opie showed in 1917 (*Jl. Experim. Med.*, 1917, Vol. 25, p. 855):—

> "That the healed or healing lesions present in the lungs of almost every individual after the age of 18 years have the characters of the tuberculosis of childhood and are, in their essential characters, distinguishable from the usual form of chronic pulmonary tuberculosis of adults, which almost invariably has its origin in the apices of the lung. Focal tuberculosis which, in great part, has its origin in childhood, may be seated in any part of the lungs, usually below the pleura, and not more frequently in the apex than elsewhere . . . It is especially significant that the focal lesion is associated with tuberculosis of the nearest lymph nodes."

The beautiful roentgenograms accompanying the article on "Evidence of First Infection," together with the photographs of the actual lungs after section, provide, in a graphic form, the evidence adduced for the view expressed by Opie that "there is little reason to doubt that the pre-existing focal lesion had modified the course of the apical infection," and that "the character and position of the focal lesion furnish support to the view that the apical disease is not derived from the focal lesion, *but represents a new infection.*" This paper on "Evidence of First Infection" is based entirely upon the examination of white adults, and the following conclusions, amongst others, are drawn by its author:—

> "Focal tuberculous lesions which have undergone calcification and are recognizable in roentgenograms of the excised lung are present in the lungs of 98 per cent. of white adults who die from diseases other than tuberculosis.
>
> "Latent apical tuberculosis has been found in the lungs of one in every five of the white adults examined. These apical lesions are invariably accompanied by evidence of a pre-existing focal infection which has had its origin in childhood.
>
> "Active pulmonary tuberculosis (phthisis) is always accompanied by evidence of a preceding tuberculous infection."

These quotations form a necessary preliminary to the consideration of the paper on "Active and Latent Tuberculosis in the Negro Race" which follows, and which depends, for its significance, upon a comparison with the findings in whites. Opie has, for convenience, made an artificial classification of the post-mortem X-ray lung pictures in terms of the extent of the calcified focal lesions detected. Applying this classification to the findings in 25 coloured adults who had died with diseases other than tuberculosis, he obtains the following results along with which, for comparison, we have tabulated his findings in 115 lungs from a comparable group of white adults:

Calcified Focal Lesions shown by X-ray Plates.

	Calcified lesions absent.	Very small calcified lesions. (Grade 1.)	Calcified lesions. (Grade 2.)	Extensive calcified lesions. (Grade 3.)
25 coloured adults per cent.	8	32	44	16
115 white adults per cent.	1·7	22·7	65·3	10·3

As Opie remarks, "the figures, though based on a small number of instances, indicate that healed, that is, calcified, tuberculosis is less extensive in the lungs of coloured than of white adults."

Further, while latent apical tuberculosis had been found in 16 out of 74 white adults, or in 21·6 per cent., it was found once only in 17 lungs of coloured adults studied under the same conditions, or in 5·8 per cent. Amongst white adults dying of chronic pulmonary tuberculosis the lesion was found, in all the 19 cases studied, to have had its origin in the apices of the lung. During the same period and under the same conditions there was, among the coloured, only one instance of apical pulmonary tuberculosis. In this case, the disease had pursued a much more acute course than that of phthisis in white adults, and at autopsy there was widespread caseation with little, if any, formation of fibrous tissue. The evidence for a preceding infection was uncertain, but ill-defined spots suggesting early calcification were noted in the X-ray plate. The disease seen post-mortem in this young adult negress "had the characters of an infantile lesion situated at the apex of the lung." While chronic lymphatic node tuberculosis occurs in but a minimal proportion of white adults with pulmonary tuberculosis, it was found to be present in two out of the small number of instances of active tuberculosis in the negro adults studied.

An interesting text-figure, here reproduced, illustrates a case of pulmonary tuberculosis in a coloured woman of 26 years, the type being exactly what is found in young white children. An acute focus of infection is seen at the base of the right lower lobe, and the corresponding extensive disease of the tracheo-bronchial and tracheal lymph nodes is well shown.

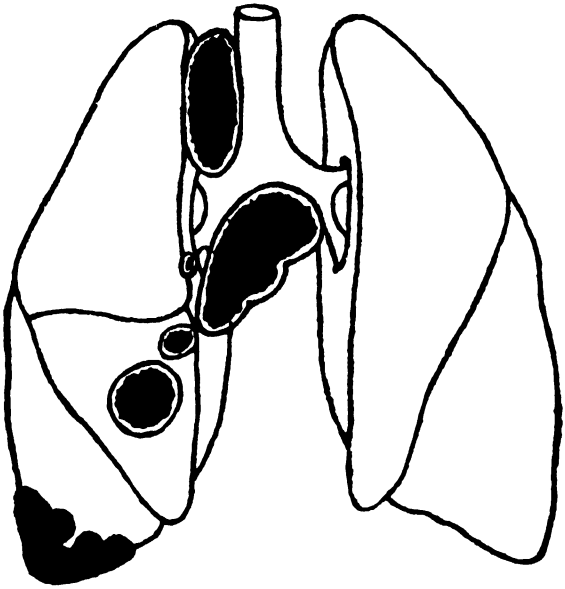


Diagram showing the distribution of pulmonary lesions in a coloured woman in the United States of America, aged 26 years. [Autopsy No. 1915.]

There is a caseous tuberculous mass at the base of the right lower lobe and massive caseous tuberculosis of peribronchial lymph nodes within the lung, of lymph nodes at the bifurcation of the trachea and of lymph nodes above the right bronchus.

[Reproduced from the *American Review of Tuberculosis*]

Opie considers that these differences observed in negroes from the clinical and pathological types seen in the tuberculosis of white adults "are best explained by partial lack of immunization during childhood." "Deficient immunization in early life is probably much more important than increased susceptibility referable to malnutrition and other conditions of living or to natural racial susceptibility."

The most important of the conclusions drawn are that the American negroes are less thoroughly tuberculized than the white race, and that "the tuberculization of a race which has for the first time come into contact with tuberculosis proceeds slowly because the acute types of tuberculosis which make their appearance are not adapted to scatter the tubercle bacillus."

S. L. C.

GRANDY (Charles R.). **Racial Characteristics as the Cause of the High Tuberculosis Death Rate among Negroes.**—*Amer. Rev. of Tuberculosis.* 1924. Nov. Vol. 10. No. 3. pp. 275–279.

Grandy, writing of observations made in Norfolk, Virginia, gives figures showing that, though the tuberculosis death rate for both the white and the coloured population has fallen markedly since 1907, the reduction in the white race has been relatively greater. He is, however, impressed with the real success which has been attained by an adequate tuberculosis organization for negroes, a success which has been much greater than was to be anticipated when he went into the question in 1908.

Starting from the dictum of EMERSON that " the problem of tuberculosis is the problem of nutrition," Grandy has investigated differences in nutrition and posture between white and coloured school-children and finds, at his clinic, as well as at the schools of Norfolk and Richmond, that the average coloured child is considerably heavier for his height and age than the average white child. In an examination of weight charts of children between 6 and 12 years, he finds that 24·6 per cent. of 967 white children are 10 per cent. or more under weight as compared with only 14·6 per cent. of 822 coloured children ; this, although the average income of the coloured families concerned was well below that of the white families from which the children were drawn. Further, it is rare to find the fatigue posture in a coloured child except in light mulattoes, in whom the white characteristics predominate. As Grandy says, " viewed from this standpoint it seems that we should have less tuberculosis in negroes than in whites." Rather than question the dictum of EMERSON above quoted, he is obliged to conclude " that the height-weight tables are not infallible, and that external appearances are deceiving as indices of health." But, although expressing this opinion, Dr. Grandy is clearly a little troubled on the point, to which he returns again later. He does not deny that the negro's manner of living and his lack of prolonged racial adaptation to the life of the white man " may have an influence on his morbidity and mortality from tuberculosis ; but," he goes on, " when you see a big, strong negro with moderate infection go on and die in spite of treatment, and a weak Jew with a deal more trouble get well, the likelihood of a racial or inherited immunity stands out prominently over and above all other causes." It is interesting to read this conclusion in conjunction with those of OPIE above quoted, where the immunity acquired through individual infection is given a prominent place.

S. L. C.

AGOSTINI (J. P.). **Remarks upon the Problem of Tuberculosis in Cuba.**—*Edinburgh Med. Jl.* 1925. Mar. New Ser. Vol. 32. No. 3. pp. 103–106.

This brief paper is of a general nature and does not include details about the tuberculosis of Cuba, but it is suggestive in several respects. For one thing, it pays a remarkable tribute to the success of the campaign of Preventive Medicine which followed the assumption of administrative responsibility by the Americans after the war of 1898. It would seem that this event led not only to the elimination of yellow fever and malaria as constant menaces to health, but greatly decreased the incidence of tuberculosis as well.

Dr. Agostini states that more than half of the three millions of population are "whites"; and it would appear that the tuberculosis of Cuba is, in general terms, that of a white population. As in Europe, it is in centres of industrial agglommeration that it is seen at its worst. "The great seeding places of tuberculosis" are the cigar and cigarette factories.

S. L. C.

RODHAIN (J.). **Rapport sur la tuberculose humaine au Congo Belge.**—*Revista Méd. de Angola.* (No. especial 1^c Congresso de Med. Trop da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 201–215. With 1 chart. [5 refs.]

Although there must have been occasional contact with tubercle bacilli through Arab incursions from the north, and the occasional arrival on the coast of slave-traders from Europe, it has only been since the opening up of the interior to commerce during the Belgian occupation that the natives of the Congo Province have been definitely exposed to infection on a significant scale. Of the present state of things, Rodhain speaks as follows:—

"The European carrier of Koch's bacillus has contaminated the native auxiliaries living in contact with him, soldiers, boat-men, labourers; and these, returning to their villages, have spread the infection in their turn. Little by little, endemic foci of tuberculosis have become established around the more important European centres and, although still rare in the interior, the scourge is spreading."

The author gives a brief summary of the history of this spread of tuberculous infection, instancing the case of a medical officer affected with phthisis whom he succeeded at Coquilhatville in 1904, and whose two native servants died of pulmonary tuberculosis within the next three or four years. On his return to Léopoldville in 1907, he was struck by the sharp increase in the number of natives entering the "Hôpital des Noirs" with tuberculosis, and was constrained to report as follows in 1909:—

"The outstanding fact is the number of cases presenting the signs of tuberculosis in its different forms. Introduced from Europe, this disease, so fatal to negroes, has increased so rapidly as to occupy an important place amongst the pathological features of the area."

The observations of MOUCHET (1913) are quoted as to the post-mortem findings in tuberculous natives and on the von Pirquet reactions of various native groups in and around Léopoldville, which is noted as a definite though recently infected endemic centre. From the report of MOUCHET he cites the remark that "the native population responds to tuberculous infection in the same manner as do children in Europe."

It would appear that MOUCHET noted both at Katanga and at Stanley Pool "la rareté de l'évolution lente et progressive de la tuberculose." The type was acute and rapidly fatal. A good idea of the contrast in clinical type between the tuberculosis of European settlers or officials on the one hand and infected natives on the other is given in the table of cases of human tuberculosis in the colony from 1915 to 1922:—

CASES OF HUMAN TUBERCULOSIS FOUND IN THE COLONY FROM 1915 TO 1922.

Year.	Number of recorded cases.		Number of deaths.		Observations.
	Europeans.	Natives.	Europeans.	Natives.	
1915 ...	13	100	—	41	It is possible that certain patients were duplicated in 1916 and 1917.
1916 ...	30	80	1	39	
1917 ...	46	109	2	45	
1918 ...	52	190	1	44	
1919 ...	34	212	3	65	
1920 ...	33	208	4	56	
1921 ...	25	233	2	60	
1922 ...	20	209	2	103	

It will be seen from the table that of 253 European cases only 15 died, or just under 6 per cent., while of 1,311 native patients, 453, or over 34 per cent., had died in the period of the observation. The table is noted as incomplete, since it deals only with the native cases coming to notice close to European centres. Doubtless many cases died undiagnosed, at places remote from skilled medical investigation. The distribution of infection throughout the country is roughly indicated by the cuti-reactions of the natives in the military school of Irebu in June, 1923 (Dr. SARCINELLA), the cadets representing 21 different centres of origin. The results are as follows :—

Number examined.				Positive results.				Intradermic control.		
Men.	Women.	Children over 5.	Children under 5.	Men.	Women.	Children.	Per cent.	Men.	Women.	Per cent.
894	273	79	39	52 or 5·77 per cent.	7 or 2·57 per cent.	0 or 0	Mean 4·8	21 or 2·3 per cent.	1 or 0·37	Mean 1·6 per cent.

As a contrast to these figures may be quoted the following table illustrating the cuti-reactions amongst scholars at Stanley Pool, drawn for the most part from homes at Léopoldville and Kinshasa :—

Scholars over 15 years.				Scholars under 15 years.				Totals.		
No. examined.	No. of positive cuti-reactions.	Per cent.	No. of doubtful cases.	No. examined.	No. of positive cuti-reactions.	Per cent.	No. of doubtful cases.	No. examined.	No. of positive cases.	Per cent.
63	34	54	16	287	76	27	4	350	110	31·4

Here the "positives" are not far behind those noted in European communities. It is of great interest to learn that, shortly after the recording of these skin reactions, an old instructor-carpenter on the staff of the school died of a relatively chronic phthisis with cavities, having been ailing for three years. "Les écoliers ont donc rencontré l'occasion d'absorber des parasites."

The results of post-mortem examination give, perhaps, the clearest idea of the facts about tuberculosis in any given area. The following table is therefore quoted as perhaps the most important element in this valuable paper.

DISTRIBUTION OF TUBERCULOUS LESIONS REVEALED AT AUTOPSY.

Tuberculous Lesions.	Autopsies done at—			Totals.
	Léopoldville : Dr. Mouchet.	Katanga : Dr. Mouchet.	Boma : Dr. Fornara.	
Pulmonary Tuberculosis ...	26	54	21	101
Pleural ,, ...	5	8	—	13
Intestinal ,, ...	19	26	4	49
Renal ,, ...	2	3	1	6
Hepatic ,, ...	3	3	1	7
Splenic ,, ...	2	4	2	8
Laryngeal ,, ...	1	1	1	3
Peritoneal ,, ...	1	3	1	5
Cardiac ,, ...	2	2	—	4
Pericardiac ,, ...	—	1	1	2
Osseous or Osteoarticular ,, ...	1	2	2	5
Meningeal ,, ...	1	1	—	2
Cerebral ,, ...	—	—	1	1
Vesical ,, ...	—	—	1	1
Generalized Miliary ,, ...	12	27	9	48
Tuberculous Meningitis ...	1	6	?	7
Hemoptysis	1	1	?	2
No. of Autopsies	31	72	26	129

Dr. Rodhain closes his communication with a summary of the efforts made to protect the population of the Belgian Congo from further contamination, so far as this may still be possible. The Governor General, in an Order of August 7th, 1921, indicates the prophylactic measures to be used to combat the extension of tuberculosis in the colony. Notification of cases is made compulsory. The entrance to the colony of foreigners with "open" tuberculosis is forbidden. Those now resident in the colony and found to be suffering from the disease must take their departure as soon as possible and must, in the interval and during transit, submit to special prophylactic precautions on pain of isolation in hospital. Somewhat similar regulations are to apply to natives. Doctors are given the right to examine persons of all races with a view to diagnosis of the disease and the application of the precautionary measures above described. These rules, if successfully applied, should go some way towards checking the too rapid spread of tuberculosis, but, as Rodhain admits, "we know that, besides the *sick* carriers of the tubercle bacillus, there exist persons in apparently good health who are quite capable of spreading infective germs"; and it is here that the greatest difficulty is likely to be encountered.

S. L. C.

FORNARA (A.). **Note sur les formes de l'infection tuberculeuse chez les indigènes à l'hôpital des noirs à Boma.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sassão de encerramento.) 1923. Aug. No. 4. pp. 221–227. [3 refs.]

From a close and careful study of the post-mortem findings as well as of the clinical features of tuberculous cases amongst the natives of Boma, Fornara draws some interesting conclusions. The distribution of lesions found in 26 autopsies has already been given (see p. 437); it should be noted that, amongst instances of tuberculous adenitis, the following distribution was observed :—

Cervical adenitis	1
Pre-aortic	1
Mesenteric	5
Mediastinal and Peribronchial	12

The preponderance of intra-thoracic adenitis suggests the respiratory route as the chief portal of infection. Fornara has observed at Boma five cases of osteo-articular disease. He describes a case of tuberculosis of the knee-joint which has lasted for six years and is complicated with pulmonary disease. In an interesting discussion as to the factors underlying the special susceptibility of blacks to tuberculosis, he lays stress on "the absence of the previous vaccinations," so common in Europe in the form of "discrete infections contracted in early life," and raises the important question as to "whether the negro is capable of developing an immunity when in contact with tubercle bacilli or whether his organic qualities are incapable of such a defensive organization."

In an attempt to find in his own observations an answer to this question, he believes that he has been able to recognize a definite tendency to a heightened defensive power of the tissues revealing itself in a chronic type of disease and in the anatomo-pathological changes characteristic of a resistant power. The proportion of cases showing, at autopsy, the lack of resistance so common in African natives is now less than that noted at Léopoldville and Katanga by MOUCHET in 1912–13 and 1918 20.

S. L. C.

ORENSTEIN (A. J.). **Interim Report on Silicosis and Tuberculosis.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1924. Dec. Vol. 4. No. 8. pp. 13–14.

This brief analysis of Post-Mortem Diagnosis Cards from the Witwatersrand Native Labour Association Hospital, dealing with the examination of 95 consecutive cases during the period October 1922 to September 1923, constitutes a real contribution to our knowledge of the tuberculosis of the South African native labourer. Statistics based on death-rates or morbidity rates may sometimes be of value if interpreted with a proper appreciation of the nature of tuberculosis, but carefully recorded post-mortem findings reveal the nature of the disease itself and form an unequivocal basis for comparison with the tuberculosis of other areas. Only cases in which tuberculosis was found to be present at post-mortem examination are included in the card enquiry, so the 95 cards all contain a reference to the disease. Tuberculosis was the cause of death in 62 cases, 10 of these being instances of tuberculosis with silicosis. The list of post-mortem diagnoses includes, also, seven cases of silicosis, and in these, presumably, the tuberculosis was minimal and the silicosis alone sufficient to account for death. It would appear, too, that over and above the 17 cases of "silicosis" and "tuberculosis with silicosis" there were others in which some degree of silicosis was present, as an analysis of "the lesions in cases exhibiting silicosis" suggests that any number from a minimum of 19 to a maximum of 64 cases gave evidence of silicotic changes. This numerical obscurity, depending on an omission to state whether several different types of lesions were noted in the same case, will doubtless be eliminated when more extensive analyses are published later on.

The facts noted about the tuberculous lesions are of such interest as to warrant their reproduction *in extenso*:—

PULMONARY TUBERCULOSIS :—

Involvement of pleura—

Right pleura, 8. Left pleura, 7. Both pleuras, 25. Empyema, 1.

Lesions of lungs—

Caseating ...	Right lung, 4.	Left lung, 6.	Both lungs, 17.
Miliary ...	—	—	„ „ 15.
Both miliary and caseating	—	—	„ „ 9.

Enlargement of glands—

Peribronchial, 55 cases. Mediastinal, 39 cases.

OTHER ORGANS AFFECTED WITH TUBERCULOSIS :—

Liver ...	miliary, 18,	caseous, 5.	Adrenals ...	miliary, 5,	caseous, 2.
Kidneys	„ 9,	„ 5.	Pericardium	„ 6,	„ 2.
Spleen ...	„ 18,	„ 14.	Peritoneum ...	„ 8,	„ 1.
			„ with effusion ...	„ 2,	„ 3.

Small intestine, 7. Retroperitoneal glands, 26. Cervical glands, 1.

Tubercular abscess of brain, 1. Bone tuberculosis, 1.

It will be seen that the lung lesions were all either "miliary" or "caseating" or both combined; that there were miliary lesions in *both* lungs in 15 cases, caseating lesions in *both* lungs in 17 cases, and combined miliary and caseating lesions in both lungs in nine cases. There is no mention of cavitation. While this may, of course, have been observed, the reader gains the impression that it cannot have been a marked feature. There was enlargement of the peribronchial glands in 55 and of the mediastinal glands in 39 cases. For those who are familiar with necropsy findings in this country, it would be impossible to present more forcibly the contrast between the post-mortem appearances in adult pulmonary tuberculosis as between African natives and Western Europeans. The abdominal organs showed tuberculous lesions in a large proportion of the cases, the number of caseous lesions being so great as to recall to the reader the findings usually observed in monkeys.

Dr. Orenstein rightly concludes from these records that tuberculous infections still run a markedly acute course in native mine workers. His other conclusion, "that infection by ingestion of tuberculous material may play a not inconsiderable rôle in the incidence of tuberculosis" amongst these labourers, is, we think, less justifiable. The fact that there was enlargement of the peribronchial or mediastinal glands in nearly all the cases, or, to put it otherwise, that the glands draining the lungs were almost invariably affected, strongly suggests that it was through the respiratory tract that the infection entered the body.

[Experiments in the pathogenesis of tuberculosis carried out on guineapigs by the reviewer have shown him how easily the infection is spread throughout the body by the blood-stream after the initiation of caseous tuberculosis in the lymphatic glands of susceptible animals. There is no reason to assume that the abdominal lesions were of intestinal origin since the diffuse exudative pulmonary and intrathoracic glandular lesions were clearly of a nature to favour rapid generalization through the blood-stream.] The fact that so many of the abdominal lesions are recorded as "miliary" lends strong support to this view. Dr. Orenstein and the Transvaal Mine Medical Officers' Association are to be congratulated on having initiated an enquiry which promises to be as illuminating as that of BORREL on the pathological lesions in the tuberculosis of Senegalese soldiers. It is, indeed, a matter of the greatest interest to note the similarity between BORREL's findings and those now recorded. (See this *Bulletin*, Vol. 16, pp. 190–2.)

S. L. C.

LASNET. **Recherches entreprises en Cochinchine sur la tuberculose pulmonaire.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. Jan. Vol. 17. No. 1. pp. 14–22. [3 refs.] *

After a summary of the results of cutaneous tuberculin tests, corresponding in general terms with the figures already published by F. H. GUÉRIN, LALUNG-BONNAIRE and NGUYEN-VAN KHAI (see below), Doctor Lasnet passes on to the methods employed by the Tuberculosis Laboratory for the early diagnosis of tuberculosis in Cochin China. These methods, apart from the thorough clinical examination of cases, are as follows:—

1. Search for tubercle bacilli in sputum, stools, etc., after homogenization and centrifugation. It is to be noted that films studied after homogenization and centrifugation gave 11·66 per cent. more positives than direct films.
2. Radioscopy and radiography of the thorax.
3. Complement fixation (CALMETTE et MASSOL).

The author reports that this serological test was positive in 17 per cent. of cases in whom the examination of the sputum had proved negative. It appears to be the experience of some of the workers in England that the complement fixation test is sometimes positive in persons quite free from active tuberculosis, and while the findings of Dr. Lasnet are of great interest, they must not be taken as a final proof of the diagnostic value of the test. It appears, however, that the complement fixation results were often confirmed by minute clinical examination. An account is given of the work of popular education which appears to be developing on sound lines. The optimism of the author comes to the surface in such lines as the following: "Les principes hygiéniques . . . se gravent dans les cerveaux malléables des enfants et sont diffusés ensuite par eux au foyer familial." We have often heard a similar claim advanced by sanitary propagandists in this country, and the picture evoked by the phrase must be of comfort to the public lecturer on hygiene. The paragraphs on the "protection of those exposed to infection and the preservation of children" are worth careful study and show that good work is being carried out in this important direction. Acting on the advice of the Pasteur Institute of Saigon and in co-operation with the Public Health Service, the Government selected the town of Cholon as the locality for a preliminary experiment, this town presenting a unit of a size and character suitable for the test. As a basis for investigation, it was thought advisable to carry out a thorough examination of the school children of Cholon, since it was clear that infected children must serve as guides to the sources of infection existing in the houses of the area under observation.

These children, on examination, fell into four categories, as follows :—

1. Normal healthy children of sound stock, 77·5 per cent.
2. Children with more or less definite signs of tracheo-bronchial infection, but without actual contact with "suspects," 14 per cent.
3. Children with signs suggestive of broncho-pleuro-pulmonary tuberculosis actually living in contact with infected persons, 7·8 per cent.
4. Children with open tuberculosis and positive sputum capable themselves of serving as foci of infection, 0·56 per cent.

Each category is dealt with according to its necessities, and an attempt is made to get the infected parents into suitable hospitals so as to eliminate sources of contact. It is interesting to learn that preparations are being made to apply to infants in Cochin China the B.C.G. vaccine of CALMETTE. The results of this experiment are certain to be of great interest and importance, and it is impossible to refrain from applauding the initiative of the French Colonial Medical Services in so promptly applying a method which has already proved simple and efficacious in experimental animals.

S. L. C.

GUÉRIN (F. H.), LALUNG-BONNAIRE & NGUYEN-VAN KHAI. **Epidémiologie de la tuberculose en Cochinchine.**—*Ann. Inst. Pasteur.* 1924. Oct. Vol. 38. No. 10. pp. 915–922.

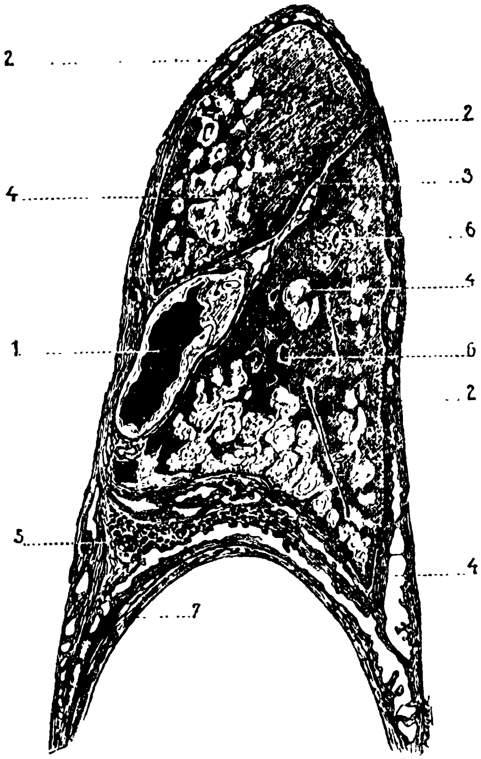
This paper, of great interest and importance, should be read in the original by all those interested in the epidemiology of tuberculosis in the tropics. It confirms and amplifies the pioneer work of BERNARD, KOUN and MESNIL (1912) in Cochin China. The same observations, already published in the Transactions of the Fifth Biennial Congress of the Far Eastern Association of Tropical Medicine, were summarized in a recent number of this *Bulletin* (see Vol. 21, pp. 985–986), and so require no further notice here.

S. L. C.

PAISSEAU (G.) & LAMBLING (André). **Tuberculose de première infection chez l'adulte.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 6. Year 40. 3rd Ser. Vol. 48. No. 31. pp. 1462–1472. With 1 text fig. [1 ref.]

The authors report in detail the clinical course and the post-mortem findings in a case of tuberculosis in a Senegalese soldier twenty years of age. The patient presented several clinical features of interest. It is unusual to find early cavitation in the tuberculosis of "virgin soil," yet a cavity formed early in this case and could be observed, on the screen, to contain both fluid and air. Again, when an acute phthisis reaches the stage of cavitation, it is usual to find that the sputum contains numerous tubercle bacilli; but in this patient the sputum was, except on one occasion, invariably negative to repeated examination, though it did infect one guineapig out of two inoculated, causing a very slow and chronic form of generalized tuberculosis. The authors, in summing up a very complete account of the case, point out that the patient presented the three characteristics laid down by CAIN and HILLEMAND as diagnostic of "tuberculosis of primary infection." These are:—

1. A tuberculous process characterized by rapid caseation with a tendency to spread towards the periphery in the form of caseous pneumonia or bronchopneumonia; and a rapid generalization from the primary area.
2. The presence of lymphatic nodes showing massive caseation.
3. Total absence of old lesions, either fibrotic or calcarious.



Tuberculous lesions in right lung of a Senegalese soldier, aged 20 years.

1. Cavity in middle lobe.
2. Adherent and infiltrated pleura.
3. Adherent and infiltrated interlobar pleura.
4. Caseous masses, pleura, bronchopneumonic foci, glands.
5. Areolar tissue.
6. Caseated bronchi.
7. Infiltrated diaphragm.

[Reproduced from *Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris.*]

A text figure illustrating the lesions found in the right lung is reproduced.

S. L. C.

PROTTEAU (P.). **Enquête sur la tuberculose par les cuti-réactions tuberculiniques dans un camp de nomades miséreux de l'annexe de Géryville (Hauts-Plateaux Oranais).**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 200–203.

This study, dealing with an Emergency Camp for starving Arabs, is of interest in affording a contrast between a population of similar environmental and racial type during a period of exceptional privation and during normal life; since a similar study of the tuberculin reactions of nomadic Arabs had been made by Dr. JAME in 1922, before poverty and want had become acute (see this *Bulletin*, Vol. 20, p. 193). JAME recorded a "tuberculin index" of 48 per cent. in 1922. Protteau finds an index of 58 per cent. in February, 1923. The conditions of life during the famine camp are briefly but well described, and the increase in the tuberculin index is attributed to a fairly general "misère physiologique."

S. L. C.

MEIRELES (João Evangelista Quintão). **Defesa contra a tuberculose.**—*Revista Méd. de Angola.* (No. especial 1^{o} Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 229–238.

The author regards as the basis of a wise prophylaxis against tuberculosis the maxim of GRANCHER, "a double ration of air, a double ration of food, a reasonable amount of work." He has some sound observations to make on the prophylaxis of conjugal tuberculosis, which he evidently regards as more frequent than is generally supposed. He thinks marriage should be forbidden to diagnosed cases, and lays stress on the dangers of pregnancy, parturition and lactation to women with pulmonary lesions. He rightly points out that a sound organization for dealing with the tuberculosis of childhood would greatly minimize the incidence and mortality of the disease in later life; and he has good advice to offer on the subject of industrial tuberculosis. A comprehensive scheme, with milk-centres, crèches, hostels, open-air schools, hospitals and sanatoria, is outlined as desirable in the defence against tuberculosis.

S. L. C.

MATHIS (C.). **A propos de la vaccination des nourrissons noirs contre le tuberculose par le vaccin B.C.G.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 938–939.

This brief note on the application of Calmette's B.C.G. vaccine to 101 new-born infants of negro race during the first 10 days of life is published with no other intention than to make known to medical men that this mode of prophylactic vaccination is in use, and to solicit their help in following up results in the patients during their subsequent careers. At the same time, it marks another step forward, in the French Colonies, towards the prevention of a disease the ravages of which must, if left unchecked, assume tragic importance in these susceptible peoples, with the future developing of industrial and other enterprises in Africa. It may be pointed out that the French Colonies point the way in respect of tuberculosis, and that our Colonial Medical Services lag far behind in this respect. It was at the instance of CALMETTE that the splendid efforts to test out the distribution of infection in North Africa by the tuberculin test were initiated some years ago; and it is to CALMETTE, once more, that this new effort to provide a logical remedy for the absence of acquired immunity in African natives is due. The future histories of these "vaccinated" negro children, if properly recorded, should provide valuable information as to how far an early infection by a living but non-virulent strain of tubercle bacillus is capable of affording protection against re-infection by virulent strains in after life.

S. L. C.

SOETOMO (R.). **Scrophuloderma bij Javanen.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 9–12. With 4 figs.

Soetomo remarks that scrophuloderma, as well as surgical and ophthalmic tuberculosis, present themselves in Java as common diseases of adults, contrary to the conditions in Europe, where such affections prevail in childhood.

W. J. Bais.

TEPPAZ (L.). **Tuberculoses animales en A.O.F.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 217–220. [5 refs.]

Although for many years the veterinary inspectors at the abattoirs of Dakar, Saint-Louis, Kayes, etc., had failed to find any cases of tuberculosis in cattle, and the disease had come to be regarded as absent in French West Africa, PIERRE had noted two cases in 1905 in a series of over 2,000 animals examined (race not stated), and PECAUD had called attention, in 1912, to the existence of tuberculosis amongst a race of cattle in Dahomey, known as the "Lagunes," finding 22 infected animals in 497, or 4·4 per cent. It would seem, then, that although the disease would appear to be rare, it does, nevertheless, exist in A.O.F. Teppaz and NAINSOUTA have so far failed to find any cases at the abattoir of St. Louis. At Dakar, however, HECKENROTH has found tubercle bacilli in pus from the udder of a cow "in milk"; and, at Dakar also, CURASSON has reported two authentic cases of tuberculosis in zebus, one of the infected animals having belonged to a phthisical native owner. Since then, Teppaz and NAINSOUTA have each discovered two cases. Teppaz attempted to ascertain the *type* of the bacilli from his two cases, and the result was not what might have been expected, since the strain from a zebu with a benign localized tuberculous lesion was found to possess the characters of a bovine bacillus, while that from an animal suffering from acute generalized tuberculosis was found to be of "human" type. In view of the contradictory nature of these findings, Teppaz prefers not to draw any conclusion as to their nature. He is inclined to think that the zebus may be resistant to tubercle bacilli of both bovine and human origin, and that the few cases noted have been accidental infections. "For practical purposes," he says, "the zebus may be regarded as refractory to tuberculosis." He very wisely adds that experiments in the inoculation of these cattle with varying amounts of bacilli of varying origin might throw an interesting light upon this important question. Amongst pigs, too, tuberculosis is rare in the A.O.F. Only six authentic instances of pigs being found infected at autopsy are on record. All these were belonging to "Portuguese" natives who had fed their pigs on ground spread with the ordure from the town. This practice has now been forbidden and, as a result, there are fewer animals infected. Though the point is not yet settled, it appears probable that the tuberculosis of the zebus is of human type. Dogs and cats have, so far, appeared free from the disease.

S. L. C.

CORREIA (Alberto Carlos Germano da Silva). **A tuberculose e os Sanatórios de Altitude em Angola.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 239–326. With 2 plates. [39 refs.]

This article falls naturally into two sections, the first consisting of a detailed discussion of the statistics of pulmonary tuberculosis in the different districts of Portuguese West Africa, so far as such statistics are available, while the second emphasizes the urgent need for the establishment of sanatoria, or at least a sanatorium, for the reception and hygienic treatment of phthisical patients. Here the author passes in review a number of hill stations, discussing the suitability of each as the site for a sanatorium. Altitude, climate and disease prevalence are, in each case, taken into consideration, and of the stations dealt with, Malange, Huambo, Silva Porto, Bela Vista, Caconda, Lubango and Humpata, the last-named is fixed on as being beyond question the most suitable, while its neighbour plateau of Palanca, presenting in general practically identical conditions, has one advantage over Humpata itself in that it is slightly better sheltered from strong winds.

F. S. Arnold.

TROPICAL OPHTHALMOLOGY: A REVIEW OF RECENT ARTICLES.—III.*

LIDS.—BISSET[1] strongly recommends the modification of Hotz's operation for trichiasis described in SWANZY's " Diseases of the Eye." She found Snellen's and Van Millingen's operations sometimes unsatisfactory, but has obtained consistently good results with this procedure. She states (1) that the operation is aesthetic and not in the least disfiguring; (2) it never fails if the first incision is correctly made; and (3) it has the advantage that no tissue is removed, and none is transplanted.

CONJUNCTIVA.—ELLIOT,[2] discussing the peculiarities that characterize epidemics of conjunctivitis in tropical countries, points out the various factors which make such epidemics differ widely from those seen in temperate lands. He further gives a short summary of the peculiar features of conjunctivitis of the gonococcal and membranous types, and of the same disease as met with in swimming bath epidemics and as a result of the action of lice. He finally discusses the rôle played by Koch-Weeks infections in tropical epidemics of conjunctivitis, and draws attention to the recent work of NICOLLE, CONSEIL, and CUENOD in the direction of preventive inoculation against this disease.

Conjunctivitis Infectiosa Necroticans (Pascheff).—STARK[3] has reported four cases clinically corresponding to this disease in which induration and swelling of the preauricular, parotid, and submaxillary glands occur accompanied by a rise of temperature. White spots, the size of a millet seed, appear on the tarsal and retrotarsal conjunctiva of one eye. Some of these spots are elevated, whilst others form ulcers; fresh crops tend to appear, and there is swelling of the lid. The conjunctival changes usually last about two or three weeks, but the glandular affection may persist for two or three months, and sometimes terminates in suppuration. PASCHEFF isolated an organism, the *Micrococcobacillus polymorphus-necroticans*, which produced typical conjunctival changes in the guineapig. No specific organism was detected in STARK's cases. Cases of monocular disease, clinically similar, have been described as squirrel plague conjunctivitis and agricultural conjunctivitis. The group closely resembles PARINAUD's conjunctivitis.

TRACHOMA.—As usual, this disease occupies a prominent place in the literature of tropical ophthalmology. The October and January numbers of the *Revue du Trachome* contain interesting papers on the distribution, prophylaxis, treatment, and economic importance of trachoma. REMLINGER and BERNARD[4] state that trachoma is not so very rife in Tangier. About 5 per cent. of the population are infected, as contrasted with 47 per cent. in Tunis. It is mostly a disease of adult life between the ages of 30 and 50. Jews are more often attacked than other races, and women are specially affected. The type commonly seen is not associated with an excessive conjunctival discharge. They conclude that the disease is neither endemic nor epidemic in Tangier, but that it is most often imported. DEMARIA,[5] describing trachoma in the Argentine at the Seville Congress, stated that the country was infected by the flow of immigrants in 1880. The disease is now wide-spread, and is quite commonly found at high altitudes. Some centres, notably the provinces of Tucuman and Santiago del Estero, are more heavily infected than others. He thinks that trachoma is not an extremely contagious disease, and only spreads in a new country if great numbers of infected immigrants arrive at the same time. LEFORT[6] states that latent trachoma is very rife in Morocco and constitutes a grave danger there. Europeans are far from immune. Corneal lesions are much more common there than in Egypt. Secondary infections with Morax-Axenfeld bacillus were found in 35 per cent. of the cases, with Koch-Weeks bacillus in 25 per cent., and with the gonococcus in 5 per cent. These complications of trachoma occur at the end of September and in the beginning of October in the damp, or pomegranate, season. Affections of the lachrymal passages keep up the trachoma infection, and these must be carefully treated. CANGE and FOLEY[7] say that they have never observed acute trachoma in Algeria. They emphasize (1) the consistently bilateral character of the disease, and (2) the fact that it commences in and displays a marked predilection for the superior cul-de-sac. They note the prevalence of three types: (1) follicular, 13 per cent.; (2) papillary, 43 per cent.; and (3) lardaceous, 16 per cent. They remark that a considerable proportion of the cases may undergo a spontaneous cure without causing any deformity of the eyelids. MCMULLEN[8] is inclined to believe that the true explanation of the apparent prevalence of trachoma in Kentucky is the fact that much publicity has been given to the presence of the disease in that State. COLLIN,[9] reporting on the prophylaxis of trachoma in the schools of North Annam, concludes that the tropical light, together with the sand and dust in the air, pave the way for the infection of trachoma; flies, encouraged by filth and squalor, convey the infection; dirty cloths, dirty hands, and the use of a common kohl stick spread the disease in a family. The question of prophylaxis and treatment is bound up with that of cost. LACROIX[10] says that trachoma is not uncommon in Rouen, being brought there by foreign workmen who have come to the factories. There are two sources of the disease: (1) the Mediterranean element of Algerians and Spaniards; and (2) the Belgian element. The Algerians are the main danger. The Belgian source is traceable to the Flemish in whose part of the country the disease is endemic.

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* For the second of this series see Vol. 21, pp. 976–983.

[1] BISSET (M. R.). A Useful Operation for Trichiasis.—*Jl. Assoc. Med. Women in India.* 1924. Nov. Vol. 12. No. 4. pp. 12–14.

[2] ELLIOT (Robert H.). Conjunctivitis in the Tropics.—*Brit. Med. Jl.* 1925. Jan. 3. pp. 12–14.

[3] STARK (H. H.). Conjunctivitis Infectiosa Necroticans (Pascheff). Report of Four Cases corresponding clinically to this Condition.—*Jl. Amer. Med. Assoc.* 1924. Dec. 13. Vol. 83. No. 24. pp. 1915–1916. [8 refs.]

[4] REMLINGER (P.) & BERNARD (L.). Le trachome à Tanger.—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 925–937. [20 refs.]

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[5] DEMARIA (Enrique B.). La conjonctivite granuleuse dans la République Argentine. Dissémination et prophylaxie.—*Revue du Trachome.* 1925. Jan. Vol. 2. No. 1. pp. 27–55.

[6] LEFORT. A propos du trachome au Maroc. Considérations cliniques. Traitment. Prophylaxie.—*Revue du Trachome.* 1924. Oct. Vol. 1. No. 4. pp. 124–135.

[7] CANGE (A.) & FOLEY (H.). Le trachome en Algérie. Ses formes cliniques.—Son évolution.—*Arch. Inst Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 183–195. [10 refs.]

[8] MCMULLEN (John). Trachoma.—*Southwestern Medicine.* 1924. Sept. Vol. 8. No. 9. pp. 425–426.

[9] COLLIN. 1er Rapport sur la prophylaxie scolaire anti-trachomateuse. (Tournée du Nord Annam, Mai 1924.)—*Revue du Trachome.* 1924. Oct. Vol. 1. No. 4. pp. 142–144.

[10] LACROIX (A.). Le trachome à Rouen.—*Revue du Trachome.* 1924. Oct. Vol. 1. No. 4. pp. 135–138.

Diagnosis.—VANCEA,[11] working on the lines described by SGROSSO, mentioned in previous articles, after having tested the complement fixation of 48 typical trachomatous subjects with adenoid antigen, came to the conclusion that this method has no value as an aid to the diagnosis of trachoma. MCMULLEN[8] thinks that the diagnosis of trachoma rests on conjunctival hypertrophy and the presence of trachoma granulations. To determine the presence of hypertrophy it is necessary to evert the lid and examine the small vessels of the palpebral conjunctiva; these should be readily traced from the ciliary border to the cul-de-sac; but, if hypertrophy is present, some portions of them will be obscured or buried beneath the abnormal tissue. ARANGO[12] mentions the same point. He warns against mistaking folliculosis for trachoma, an error easily made. Folliculosis is quite often found in young children convalescing from one of the infectious diseases of adolescence; and is often associated with enlargement of the tonsils. The condition predisposes to the development of trachoma. The membrane retains its elasticity and is free from any cicatricial process in folliculosis. He considers that chronic and non-secreting forms of trachoma are only slightly contagious, and that normal, healthy eyes, which are free from sources of irritation, may resist direct trachoma contagion.

Treatment.—Nothing novel has been evolved in the way of treatment. HAYES and OLDT[13] claim to have effected 70 per cent. of cures in Chinese in an average of 12·3 days per patient. They perform a thorough grattage with a 1–2,000 solution of mercuric bichloride after having scraped the conjunctiva with a blunt knife. They follow MCMULLEN'S technique throughout. AUBARET, in a paper on the crushing of trachomatous granules, reviews the history of the treatment, and describes his special instrument, with the indications and contra-indications for its use. In a subsequent discussion ABADIE emphasized the fact that the granulations, found in trachoma, merely represent the tissue reaction to the pathogenic organism; remedial measures should be directed against the latter. LACAT testified to the value of brossage, or of puncture with a cautery, even in cases where the cornea is gravely affected.

General.—SÉDAN and MASTIER[14] have indicated the importance of the disease from the point of view of claims made under the Workmen's Compensation Act. They discuss their subject under three headings: (1) The direct inoculation of trachoma as a result of an accident; (2) the waking up of a latent trachoma by an accident; and (3) the coincidence of a developing trachoma with the occurrence of an accident. They are very sceptical as to the validity of the first head, and think that what generally happens is that the medical man who sees the case in the first instance neglects to observe, or to put on record, the presence of trachoma. TRIAUD and CARBONI[15] draw attention to the important financial considerations introduced into the recruitment of Northern African natives into the French service in view of the appalling prevalence of trachoma among them. There is the danger that the disease may be imported into France by the native members of the crews of French ships. Again, there is the important problem of the maintenance of individuals whilst under treatment for the disease, and of the pensions allotted to those who are invalided out of the service. France is adopting a vigorous policy to extend the hospitals in the infected areas, and to provide eye specialists to take charge of them. An energetic school campaign is being pressed at the same time. The key-note of all the work is contained in these words :—"The poison of trachoma is found in the tears, and the rôle of the fly in spreading the disease has been proved." SCHOUSBOË,[16] in a paper upon trachoma affecting French troops in North Africa, described the effect of the disease on recruitment under conditions of compulsory service. The trachomatous subject knows that his disease will secure his rejection from the army and therefore does not desire a cure ; he remains a source of danger to others in consequence. In SCHOUSBOË's opinion, trachoma does not attack a healthy conjunctival membrane, but only one whose resistance to disease is lowered. He makes various recommendations, and considers that trachomatous recruits might be accepted much more freely if these were carried out.

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[11] VANCEA (Petre). La réaction de fixation du complément dans le trachome avec un antigène adénoïdien.—*C.R. Soc. Biol.* 1925. Feb. 6. Vol. 92. No. 4. pp. 303–304. [1 ref.]

[12] ARANGO (Miguel). Trachoma and Pannus.—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 646–656. [United Fruit Company, Boston, Mass.]

[13] HAYES (C. A.) & OLDT (F.). Grattage in the Treatment of Trachoma.—*China Med Jl.* 1924. Nov. Vol. 38. No. 11. pp. 899–906. [3 refs.]

[14] SÉDAN (J.) & MASTIER. Trachome et accidents du travail.—*Revue du Trachome.* 1924. Oct. Vol. 1. No. 4. pp. 138–141. [7 refs.]

THE CORNEA.—FINDLAY[17] has conducted experiments which suggest that experimental *keratomalacia* may be due to a change in the secretion of the paraocular glands brought about by an absence of vitamin A in the diet. FLEMING has shown that human tears may have a powerful lytic effect on certain bacteria, and has termed the substance which causes the lysis "lysozyme." Experiments on rabbits, placed on a diet deficient in vitamin A, showed that a definite decrease in the lysozyme content of the tears coincided with the onset of keratomalacia. Unheated human tears were found effective in preventing keratomalacia, whereas tears heated to 70° C. were less effective, and physiological saline solution was useless as a preventive. The reviewer doubts whether the keratomalacia experimentally produced in animals is entirely identical with the disease he was familiar with in Madras. There necrosis of the substantia propria seemed quite commonly to precede any change in the corneal epithelium. WHITHAM[18] has reported two cases of *epithelial dystrophy of the cornea in diabetes.* FUCHS in 1910 first drew attention to this class of case. The affection is a dystrophy and not an inflammation. It occurs most often in middle life, usually attacks females, is frequently associated with signs of glaucoma, and is slowly and steadily progressive. The aetiology is not understood. In both of WHITHAM's cases the corneal condition was degenerative rather than inflammatory, and was greatly benefited by efficient treatment of the diabetes. In one case there was a ring-shaped area of opacity which developed from a crescent situated half way between the centre of the cornea and the limbus. In the second case the cornea was generally steamy; in both the corneal epithelium desquamated far too readily. In one slight transitory hypertony was several times noticed, whilst in the other marked glaucoma was present.

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[15] TRIAUD & CARBONI. Note sur le trachome en Afrique du Nord ; son retentissement indigène ; importance de la lutte antitrachomateuse.—*Jl. Méd. de Bordeaux.* 1924. Aug. 25. Vol. 101. No. 16. pp. 703–705. [4 refs.]

[16] SCHOUSBOË. Au sujet des mesures à prendre en vue de la prophylaxie anti-trachomateuse dans les contingents de l'Afrique du Nord. La lutte contre le trachome dans l'armée.—*Revue du Trachome.* 1925. Jan. Vol. 2. No. 1. pp. 15–23. [6 refs.]

[17] FINDLAY (G. Marshall). A Contribution to the Aetiology of Experimental Keratomalacia.—*Brit. Jl. Experim. Path.* 1925. Feb. Vol. 6. No. 1. pp. 16–21. With 1 fig. & 2 charts. [7 refs.]

[18] WHITHAM (Lloyd B.). Epithelial Dystrophy of Cornea an Ocular Manifestation in Diabetes.—*Amer. Jl. Ophth.* 1924. Oct. Ser. 3. Vol. 7. pp. 759–763.

CATARACT.—WRIGHT,[19] analysing 250 cases of cataract operated on by him by Barraquer's method, comes to the conclusion that phakoeresis is probably more valuable in selected cases than any other method yet introduced for the removal of the lens in its capsule; the operation is, however, inappropriate in a large number of cases. The procedure, in common with others which remove the lens in its capsule, deprives the vitreous body of the support afforded by the posterior layer of the capsule and the suspensory ligament; pathological changes in the posterior segment of the eye may occur in consequence. These changes are likely to be all the more dangerous to sight if the eye was not entirely healthy previous to operation. When applying the suction cup to the anterior layer of the lens capsule, great care must be taken to avoid inclusion of the iris. If the pupil is small, this stage of the operation may prove difficult.

An operation for cataract on a diabetic patient naturally causes greater anxiety to the surgeon than one when the constitutional condition is healthy. Very strict attention to aseptic technique is demanded, and the minimum amount of trauma should be inflicted. LIPPMANN[20], recording the statistics of 63 operations for cataracts in diabetic patients, states that two eyes were lost, one from staphylococcal infection, and the other from a mycotic iridocyclitis. Two more cases of iridocyclitis had occluded pupil, while five more had iritis but ended well. Two cases developed retrobulbar neuritis, one immediately after the healing of the wound, and the other a year later. One case of diabetic retinitis and six of haemorrhage into the anterior chamber occurred. Detachment of the retina took place in two patients. The result was bad in 16 cases out of the 63. The practice of blocking the branches of the facial nerve as a preliminary to the extraction of cataract is spreading, and ROBISON[21] has published a valuable article upon the technique.

GLAUCOMA.—SMITH,[22] writing from his experience of the disease amongst the Chinese, states: " The question ' What are the indications for operation in glaucoma? ' can be answered in three words, viz., ' A sure diagnosis '." This advice is, unfortunately, too often neglected.

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[19] WRIGHT (R. E.). A Series of 250 Cataract Extractions by Barraquer's Method.—*Brit. Jl. Ophth.* 1925. Feb. Vol. 9. No. 2. pp. 57–63.

[20] LIPPMANN (Waldemar). Operationsresultate bei Cataracta diabetica.—*Med. Klin.* 1921. No. 37. pp. 1115–1116.

[21] ROBISON (J. Mathews). Some Observations on Blocking of the Fifth and Seventh Nerves as an Accessory in Cataract Operations.—*Arch. of Ophth.* 1924. Vol. 53. pp. 570–578.

[22] SMITH (D. V.). Indications for Operation in Glaucoma.—*China Med. Jl.* 1924. Oct. Vol. 38. No. 10. pp. 816–820.

GENERAL DISEASES. *Kala azar.*—LING[23] and LEE[24] describe the retinal haemorrhages which they have observed in kala azar patients. These appear to have been related to the general anaemia associated with the constitutional disease. Xerosis and keratomalacia were also met with; these conditions in Eastern countries are closely connected with the lowered nutrition which is one of the outstanding features of kala azar.

DRACONTIASIS.—WRIGHT[25] removed an encysted guinea-worm from the orbit of a Hindu female child, aged 5. The identification of the specimen was made by Professor LEIPER. A case of this nature is worth noting on account of its rarity.

ACCIDENTAL INJURIES.—Discussing injuries to the eyes of native mine workers in South Africa, NAPIER[26] remarks that the chief features displayed are: (1) There is marked delay in seeking advice; (2) severe injuries may sometimes be comparatively painless; (3) over-treatment may occasionally be a source of irritation.

MISCELLANEOUS.—MACCALLAN,[27] describing the ocular discomfort experienced by Europeans subjected to the influences of sun, dust and wind in Egypt, states that the hot climate is likely to cause fatigue and ill-health; trifling errors of refraction and slight degrees of heterophoria then exert effects quite out of proportion to their actual severity. Europeans should be very careful to ensure that their children do not acquire a conjunctival infection from native attendants. A seasonal hot-weather rise in acute ophthalmias (especially gonorrhoeal) regularly occurs in Egypt. Gonorrhoeal ophthalmia is usually non-venereal, the infection spreading from eye to eye.

Sir Arnold LAWSON,[28] in his Presidential Address to the Ophthalmological Section of the Royal Society of Medicine, discussed the value of different tints in glasses, a subject of importance to residents in the Tropics. He stated that the eye is adapted to endure without harm the ultra-violet and infra-red radiation of ordinary daylight under normal circumstances. Any danger arising from the subjection of an eye to intense sunlight would seem to result from the red rather than the violet end of the spectrum. Under certain conditions of health prolonged exposure to even moderate degrees of light may be harmful, because the natural resistance may be lowered. When considering the value of the tint to be prescribed, it is important to remember that this is greatly affected by the thickness of the glass supplied by the optician. The effect of tint upon the temperament of the patient, too, must be taken into account. Investigation showed that all the tints compounded with Crookes' glass give good protection against ultra-violet rays, but are not so efficient as the corresponding shade of Fieuzal as regards the blue and violet end of the visible spectrum.

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[23] LING (W. P.). Ocular Changes in Kala Azar in Peking.—*Amer. Jl. Ophth.* 1924. Nov. Ser. 3. Vol. 7. pp. 829-834.

[24] LEE (T. P.). Ocular Findings in Kala Azar in Central China.—*Amer. Jl. Ophth.* 1924. Nov. Ser. 3. Vol. 7. pp. 835-837.

[25] WRIGHT (R. E.). Encysted Guinea-Worm of the Orbit.—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 458-459.

[26] NAPIER (F. H.). Some Injuries to the Eyes of Native Mine Workers.—*Med. Jl. S. Africa.* 1925. Jan. Vol. 20. No. 6. pp. 149-152, and *S. African Med. Rec.* 1925. Feb. 14. Vol. 23. No. 3. pp. 43-48.

[27] MACCALLAN (A. F.). Ophthalmology in Egypt.—*Brit. Med. Jl.* 1925. Mar. 21. pp. 551-552.

[28] LAWSON (Arnold). Tints and their Value.—*Proc. Roy. Soc. Med.* (Sect. of Ophth.). 1925. Apr. Vol. 18. No. 6. pp. 24-32.

Fieuzal, Nos. 3, 4 and 5, afford the most powerful protection of all known tints with regard to the violet end of the spectrum, more even than Peacock Blue. Crookes' A 2 provides substantial protection from ultra-violet radiation without seriously impeding the luminous rays. Crookes' B gives good protection throughout the whole length of the spectrum and can be recommended for general use. Peacock Blue affords an infinitely larger range of protection than any other tint; it excludes all the ultra-violet and some of the violet rays at one end of the spectrum, and all the yellow, orange, and red rays at the other. Amber is the least efficient of all tints. Lawson advises that Fieuzal, 4 or 5, or Peacock Blue, may be prescribed for furnace-workers, Crookes' A for aphakic eyes and Peacock Blue for persons suffering from active inflammatory disease of the choroid or retina.

An interesting paper has been written by FERNANDO[29] on *fundus lesions amongst the Filipinos.* The paper was inspired by the work done in Madras, and is claimed to be the first effort of the kind made in the Philippine Islands. The difficulties of such an investigation amongst an ignorant population are emphasized. The dark pigmentation of the people leads to the appearance of a fundus characteristic of dark-skinned races. The nasal portion of the visual field is wider in the Filipinos than it is in Caucasians, owing to their low, flat nose bridges; consequently, the normal perimetric chart requires to be modified. As in South India, syphilis is the most frequent cause of optic atrophy. Nephritis plays a rôle similar to that which it does in Europe. No case of typical diabetic retinitis was encountered, and, though cataract is very common, glycosuria has very seldom been observed among the patients suffering from it. The eye signs of beriberi appear to be milder than those met with in Japan and elsewhere, and central scotoma has not hitherto been observed. No case of quinine amblyopia or of tobacco amblyopia has been encountered, though malaria is common, and tobacco smoking is apparently almost universal. Pyorrhoea is very common among the Filipinos, but its influence on eye trouble has not yet been traced. Cases of acute congestive glaucoma are more frequently seen at the hospital than those of the simple chronic form; this is believed to be due to the natives resigning themselves to blindness as an inevitable result of advancing years. FERNANDO has found night-blindness as a definite symptom of beriberi; it disappears when that disease is taken in hand. Epidemic night-blindness, due to vitamin deficiency, is also seen. An interesting observation is recorded of a ball-player, who after a game suffered from a sun scotoma similar to that met with in eclipse-gazing; he had been facing the sun during the game. There are a few albinos in the islands. The unclassifiable cases of optic atrophy puzzle FERNANDO just as they do workers in other tropical countries.

H. Kirkpatrick.

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[29] FERNANDO (Antonio S.). Observations on Fundus Lesions among Filipinos. —*Amer. Jl. Ophth.* 1925. Mar. Ser. 3. Vol. 8. No. 3. pp. 203–207.

HELMINTHIASIS.

KOBAYASHI (Harujiro). **On the Animal Parasites in Korea.**—*Japan Med. World.* 1925. Jan. 15. Vol. 5. No. 1. pp. 9–16. With 1 map in text. [34 refs.]

The paper gives a general review of the parasites infesting man in Korea. Of these the most noteworthy is *Paragonimus westermanii*, which occurs all over the peninsula. During 1923 an official survey showed that 9·4 per cent., or 16,866 out of 180,351 Koreans, and 0·1 per cent., or 10 out of 1,154 Japanese, were infected. Moreover, dog, cat, hog, are also definitive hosts, and one case is on record of infection in cattle. The author has found the parasite in a tigress, 3 panthers, 1 wolf and 1 fox. No difference in structure between the forms in the lower animals and those in man could be detected.

Clonorchis sinensis prevails in Southern Korea. New localities are given for the first intermediate host *Bulimus striatulus* [? *Bythinia striatula*], viz., Heitaku, Toto and Taikyu. In Heitaku, *Pseudorasbora parva* and *Leucogobio striatus* and in Taikyu *Sarcocheilichthys morii* were found infested with the encysted larvae. *Metagonimus yokogawai* is, especially in the southern part, widely distributed in Korea. In the early literature *Heterophyes heterophyes* infections in Korea are noticed, but it appears uncertain to what extent these were Metagonimus. The author has observed in the wolf a case of Heterophyes indistinguishable from *H. heterophyes.* No case of *Schistosoma japonicum* has yet been recorded for Korea.

Taenia saginata is very widely distributed. A few records of *Taenia solium* depend on identification of the eggs in faeces, and as they resemble *T. saginata* very closely these identifications are of doubtful validity. INOBA mentions the occurrence of *T. solium* in the most northern part of the peninsula. *Taenia echinococcus* occurs, but is uncommon in man. *Dibothriocephalus latus* is rare, but the author reports a case in a child of two years of age. *Sparganum mansoni* is very common in animals, but only three cases are recorded in man in Korea. In mammals usually only one large parasite is found, but in snakes several occur in one host. The author thinks that in the mammal the infection may be a secondary one due to the eating of the younger plerocercoids in snakes, for these do not mature in the intestine, but penetrate the wall and remain in the serous membrane at the same stage. In Korea the frog is not infected, whereas in Japan it is a frequent host. The adult worm occurs in Korea in dog, wolf, fox, cat, tiger, leopard and *Nyctereutes koreensis.* The author inclines to the view that the species is the same as *Dibothriocephalus decipiens*, Diesing.

Strongyloides intestinalis occurs at times in patients suffering from diarrhoea. Hookworm is common, but is rarer in the northern region ; both species are present in Korea, but *N. americanus* is the rarer form. *Ascaris lumbricoides* is uniformly prevalent. It occurs also in 20 per cent. of the hogs. *Trichuris trichiura* is likewise common, but does not appear to be so intense as Ascaris infection in the northern part. *Trichostrongylus orientalis* is common in the southern area, but is generally less numerous than hookworm. In Seoul it often infests Japanese more intensely than Koreans. Filariasis and elephantiasis occur in north and south Chusei-Do. *Trichinella spiralis* is unknown. Two cases of *Rhabditis hominis* have been recorded in

Seoul by the author. *Oxyuris vermicularis* is of general occurrence, but is rarely found in faecal examinations. A series of statistical tables summarizing the results of previous work concludes a useful résumé.

R. T. Leiper.

EASMAN [? EASMON] (M. C. F.). **Helminthiasis in the Sierra Leone Protectorate.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 305–307.

While in charge during part of 1923–4 of the two principal gaols in the Central and Southern Provinces of the Sierra Leone Protectorate and of the Bo school, a survey was made by the author for evidence of common helminths occuring in the blood, urine and faeces. He found in the blood : *F. bancrofti, loa* and *perstans* embryos ; in urine : *S. haematobium* ; in faeces : Ankylostoma, Ascaris, Strongyloides, Oxyuris, *Trichuris trichiura* and taeniae. The embryos of *F. bancrofti* appeared in 25 per cent. of the smears examined, and in 16 cases they occurred in daytime. *F. loa* was seen in two cases and *F. perstans* in one.

Although he had typical specimens of *Physopsis globosa* he was unable to find these or, indeed, any other recognized carrier at the Bo school or Kennema. 46 per cent. of the series of faecal examinations showed presence of hookworm eggs (84 per cent. at the Moyamba Prison). *Ascaris lumbricoides* occurred in 41·7 per cent., Strongyloides 14·3 per cent., Trichuris 4·2 per cent. *O. vermicularis* was a rare infection. The cases of Taenia were chiefly among Syrians from Beyrout. The helminth infections seen were unassociated with clinical symptoms. A study of the history of the cases of infection with *Schistosoma haematobium* among the boys attending Bo school for the sons of Paramount Chiefs leads the author to conclude that the infection is not acquired locally.

R. T. L.

KHALIL (M.). **The History and Progress of Anti-Ankylostomiasis and Anti-Bilharziasis Work in Egypt.**—*Reports and Notes of the Public Health Laboratories, Cairo. No. 6.* 1924. pp. 1–77. With 12 plates. [236 refs.]

This is an account of the work done in Egypt up to the end of 1923. After a brief historical review, Khalil describes the inauguration of the anti-ankylostomiasis campaign in 1913 under Looss. The committee was not only to advise on investigations necessary for prophylaxis, but to suggest treatment and collect data. A tent hospital, accommodating 100 in-patients, was established for the purpose of treatment. This was in use up till 1915 when, owing to the war, the committee's activities were discontinued. The reconstructed committee, in 1919, had the attack on bilharziasis also included in its purview. It decided to attack the two diseases on the lines of treatment, investigation and survey, propaganda and experimental work. Treatment was carried out in 6–7 annexes to general hospitals ; and details of the staff and equipment of these are given. The work for 1920–1923, during which period over 110,000 patients were examined and treated in the annexes alone, is considered in detail.

T. W. M. Cameron.

KHALIL (M.). **Incidence of Bilharziasis and Ankylostomiasis amongst the Inhabitants of Nag Hamadi District.**—*Reports and Notes of the Public Health Laboratories, Cairo. No. 6.* 1924. pp. 183–185.

In order to estimate the extent of the infections with these diseases in the Nag Hamadi district of Quena Province (Upper Egypt) an examination of the urine and stools of a fair sample of all classes of the population was made. About 75 per cent. were found to suffer from urinary bilharziasis, while only 44 per cent. harboured hookworms. Khalil considers that this wide-spread infection with bilharzia is due to the numerous canals and drains in the neighbourhood which have been constructed in the absence of other irrigation schemes. Snails of the genus *Bullinus* were found in fairly large numbers, but *Planorbis* was absent.

T. W. M. C.

FAUST (Ernest Carroll). **Some Facts regarding the Relation between Nightsoil Disposal in China and the Propagation of Helminthic Diseases.**—*Amer. Jl. Trop. Med.* 1924. Nov. Vol. 4. No. 6. pp. 487–501. With 1 plate.

The author shows how the general utilization of human faeces for manurial purposes in China and the Far East, together with improper personal hygiene, is accountable for much of the helminthic infection of the people. He then deals with those worms which do not require an intermediate host, such as Ascaris, Trichuris, Oxyuris, Strongyloides and Hymenolepis, pointing out the resistance of their ova to various chemical agents. He next treats of those which require one or more larval hosts, for example, *Taenia saginata, T. solium* and *Clonorchis.* Thirdly, those with reservoir hosts are mentioned, though constituting rather a sub-group of the second heading than a definite group of their own. The dog and cat, as ubiquitous scavengers, form a serious problem as assisting in the propagation of certain trematode and cestode infections in China.

The author suggests the lines on which remedial measures should be undertaken, bearing in mind the fact that human manure is in China an economic necessity. Firstly, adequate cooking of food, which may be contaminated either directly by manure or indirectly by serving as intermediate host for the worm; secondly, boiling of water, possibly polluted by faecal matter; thirdly, therapeutic prophylaxis; this can have a use only where there is local heavy infection which may be attacked by a specific anthelmintic. Sterilization of nightsoil is but a counsel of perfection, while educational measures inculcating the proper use of latrines, instruction in the disposal of nightsoil, in personal hygiene, and in the preparation of food, must not be forgotten.

H. Harold Scott.

KHALIL (M.). **The Relation of Sewage Disposal to the Spread of Helminth Infections in British Guiana. (A Report of the Filariasis Commission in British Guiana.)**—*Jl. Helminthology.* 1924. Sept.-Nov. Vol. 2. Nos. 4 & 5. pp. 175–190. With 8 figs. [11 refs.]

The various types of sewage disposal in use in British Guiana are considered in relation to the spread of helminth infection, viz., the pit latrine, pail closet, latrine over drainage trenches, septic tanks. A detailed study of the septic tank effluents showed that helminth eggs, including hookworm eggs, were discharged in a viable state, and it is urged that methods applicable in temperate zones must be scrutinized before adoption in tropical regions in view of the different problems which have to be dealt with.

R. T. L.

BOECK (William C.). **A Survey of Two Hundred and One Privies for Intestinal Parasites.**—*Amer. Jl. Public Health.* 1924. Oct. Vol. 14. No. 10. pp. 839–841. [5 refs.]

The contents of 201 privies in a southern city were examined for intestinal parasites and showed a number of worm infections. By far the largest number were due to Ascaris and Trichuris, but free living nematodes of the genus *Diplogaster* were very prevalent. The ova of these forms resembled those of ankylostomes. The percentages of infections in the 201 privies were: Taenia, 0·5 per cent.; Ascaris, 3·5 per cent.; Trichuris, 2·9 per cent.; Diplogaster, 25·9 per cent.; unidentified ova (probably Diplogaster), 18·4 per cent.

R. T. L.

JOYEUX (Ch.). **Action pathogène des helminthes.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 362–365. With 3 figs.

The pathological effects of helminths are conveniently grouped under the two main headings of Local and General. In the second group the actions of helminthic toxins are considered as they affect certain systems, following the lines of SIMONIN's work. It is stated that two kinds of lesions are produced according as the intoxication is acute or chronic, the former resulting in congestive and haemorrhagic phenomena, the latter more in degenerative conditions with reactionary fibrosis.

H. H. S.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **Critical Tests of Miscellaneous Anthelmintics.**—*Jl. Agric. Res.* Washington. 1924. Oct. 1. Vol. 29. No. 7. pp. 313–332. [43 refs.]

By the term "critical tests" the authors imply the administration of definite doses of anthelmintics to animals, the collection subsequently of all worms passed, the post-mortem examination of the animals and collection of the remaining worms. The relative proportion of each species of worm passed to the total is a gauge of the efficacy of the anthelmintic in question. The article comprises accounts of 15 series of investigations, each followed by a discussion. A few remarks may be made on some of the most important of the series:—

1. Dogs harbouring worms were given a combination of carbon tetrachloride, chenopodium and arecoline hydrobromide. The results did not fulfil the theoretical expectations, and the decision arrived at was that in practice it would be better to give the first or the first two drugs for ascaris and hookworms, and the arecoline a week or two later.

2. Benzyl-phenol proved to have only some 5 per cent. efficacy against hookworms, and both it and thymol were found to be inferior to carbon tetrachloride.

3. Ethylene dichloride, $C_2H_4Cl_2$, has a slight effect on hookworms in dogs, but considerably less than carbon tetrachloride, CCl_4, the result being apparently dependent upon the halogen concentration, chloroform, $CHCl_3$, holding an intermediate position as regards efficacy.

4. Ferrous sulphate, on account of its low toxicity and slow passage through the intestine and its entry into the caecum, should, theoretically, prove useful for Trichuris, but this was not supported in practice.

5. Tartar emetic intravenously was also tried for Trichuris in dogs, but single doses, even of 1 gr., were ineffectual as an anthelmintic, and there was grave risk of its toxic action.

6. Chenopodium and magnesium sulphate together gave good results, and the simultaneous administration of the saline did not diminish the anthelmintic effect of the chenopodium and, at the same time, protected from the toxic action of the latter.

7. Tests on a large scale with carbon tetrachloride for treating worms in sheep have been carried on, but the experiments are not yet completed.

Carbon tetrachloride was found to be 33 per cent. effective against tapeworms, which is a better result than previous writers have recorded.

8. As regards worms in horses, arsenic was tried because this and copper sulphate had proved useful in controlling stomach worms in sheep and goats, but the results were disappointing, and the authors conclude that carbon bisulphide and carbon tetrachloride, and perhaps chenopodium, are superior to arsenic for this purpose.

9. Novarsenobenzol, both subcutaneously and intravenously, proved of little, if any, use in the treatment of Trichuris in the dog.

The above are the most important of the results recorded in this article; many other points have necessarily been omitted, and those interested should consult the original paper.

H. H. S.

FÜLLEBORN (F.). **Referat ueber den jetzigen Stand der Therapie (besonders Chemotherapie) bei exotischen Wurmkrankheiten.** [The Present Position of Therapy in Exotic Worm Infections.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 526–535.

The author, after some pertinent introductory remarks on the difficulties of testing and gauging the results of new anthelmintic drugs, sums up by saying that, apart from the introduction of carbon tetrachloride for hookworm, advancement in the treatment of exotic helminthic affections is practically limited to antimony for schistosomiasis and dracontiasis, and emetine as a reserve for the former of these.

H. H. S.

LEACH (C. N.). **The Mode of Action of Carbon Tetrachloride.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 239–249. With 3 plates. [13 refs.]

Carbon tetrachloride is soluble in 1,250 parts at 25° C.; it boils at 46·25° C. The drug was discovered by REGNAULT in 1839, but since 1867 (SANSOM) it had seldom been mentioned in medical literature until HALL revived its use in 1921. It is a dangerous drug if given in association with alcohol. The common impurities are carbon bisulphide and occasionally phosgene (carbonyl chloride). All samples, from whatever source, are regarded by the Bureau of Science, Manila, as impure and the following routine for the purification of the product is followed : The CCl_4 is refluxed with an oxydizing solution of sulphuric acid and potassium dichromate, distilled off, treated with 15 per cent. solution of potassium hydroxide with agitation, separated, washed with water, dried with calcium chloride and carefully redistilled in glass. Recent experiments in Bilibid prison, Manila, indicate that CCl_4 does not produce the serious effects on the liver or kidney functions which have been reported. 100 prisoners were treated. The maximum dose given was 1 cc. per 5½ kilogm. of body weight. The average dose was 8·96 cc. The extremes used were 6·2 cc. and 12·5 cc. No symptoms developed which required treatment for their relief. The usual symptoms of vertigo and drowsiness are charactized by the author as " normal." The patients usually passed off into a quiet sleep lasting less than an hour or two. The cathartic action of the drug was marked and in the majority of cases the bowels moved in from 1 to 5 hours. In less than 1 per cent. was any cathartic after treatment necessary. CCl_4 is to be regarded as an intestinal irritant, and this action is increased by the prior administration of a saline cathartic. It has also a stimulant effect on the liver as evidenced by the occasional presence of bile in the urine and stool following its administration.

R. T. L.

CHANDLER (Asa C.) & MUKERJI (A. K.). **Notes on Carbon Tetrachloride as an Anthelmintic.**—*Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 61–69. [30 refs.]

In dosage of 3 to 5 cc. carbon tetrachloride can be regarded as distinctly safer than oil of chenopodium and as safe as any effective anthelmintic provided the drug is of a certain standard of purity ; is accompanied or followed by a saline purge ; is not administered to badly under-nourished or very weak individuals ; and cirrhosis or other liver derangement is regarded as a contra-indication. When it is used fats and alcohol should be avoided and a diet rich in carbohydrates but poor in fats prescribed. It is well tolerated by young children and is safe for pregnant women. In eliminating *Necator* it is distinctly superior to chenopodium, whereas it is equal or slightly inferior to this drug in its effects on *Ancylostoma.* Capsules are not required, and it enjoys the advantage of great simplicity of administration. The authors recommend the administration of CCl_4 as a 70 minim dose in skimmed milk followed by a saline purge. A combination of CCl_4 with chenopodium is very effective and is especially valuable where Ascaris infections are common. Alone CCl_4 is a little less effective than either chenopodium or santonin against Ascaris. It is more potent against Oxyuris than any other anthelmintic tried by the authors, and promising results have followed enemata of the drug in warm milk ; this with a dose by the mouth is considered worthy of a more extensive trial. CCl_4 has little or no action against Trichuris, Strongyloides or tapeworms.

R. T. L.

BLISS, Jr. (A. Richard). **A Pharmacodynamic Study of the Anthelmintic Properties of Two Oils of Chenopodium.**—*Jl. Lab. & Clin. Med.* 1925. Mar. Vol. 10. No. 6. pp. 456–461. [29 refs.]

A concise and instructive paper designed to demonstrate scientifically the relative values of oil of chenopodium from different sources from the anthelmintic standpoint and to settle the controversy thereanent. The samples employed were: (1) "Maryland oil" distilled from plants from Carroll County, Maryland. (2) "Western oil" from plants cultivated in Adams County, Illinois. (3) "Wild Western oil" from cultivated wild wormseed plants from Adams County. The common ascaris of the dog was used as the test worm. The oil was administered in soft elastic capsules—5 minims for a dog weighing 10 lb. or less, 10 for one between 10 and 20 lb., 15 for one between 20 and 30 lb., 20 minims for those over 30 lb. The dose was followed immediately by an ounce of castor oil, which is not merely purgative but protective, distributing the drug over a larger surface and promoting elimination and thus preventing toxic symptoms. The number of worms passed for five days after treatment and those found after killing the animal at the end of the fifth day were added together and the percentage of the former to the whole is recorded as the "efficacy" of the preparation used. The results, as shown in the subjoined Table, demonstrate that in their effects the differences are not great, the Maryland oil occupying a position intermediate between the two "Western oils":—

No.	Oil.	Number of Dogs.	Number Ascarides in stools.	Number Ascarides post-mortem.	Per cent. efficacy.
1.	Western oil	24	263	4	98·50
2.	Wild Western oil ...	18	155	6	96·27
3.	Maryland oil	20	188	4	97·91

H. H. S.

DORAN (G. W.). **Oleum Chenopodii as an Anthelmintic.**—*S. African Med. Rec.* 1924. Oct. 25. Vol. 22. No. 20. pp. 474–476.

The author carried out tests to determine the best results of oil of chenopodium as an anthelmintic according to: (1) The preliminary preparation of the patient; (2) the dosage; (3) the vehicle; (4) the nature of cathartic and the time of its administration after the drug.

Preliminary purge and starvation were not found beneficial, but a light meal of bread and milk or rice some 12 hours before taking the drug is recommended. The dose varied according to age, sex and general condition, but the author noticed that unpleasant effects were less in evidence if the dose was divided into two portions taken at an interval of an hour. To disguise the objectionable taste and smell the chenopodium is best given in gelatin capsules or in emulsion with Aq. menth. pip.

A saline purgative was given at intervals varying from a half to three hours later, and the best results were obtained in children when it was given after an interval of 1½ hours, in adults after 2 hours. Oil of chenopodium, he thinks, should not be combined with other anthelmintics. He does not agree that pregnancy is a contra-indication; he has given it in 5 minim doses in a large number of cases without any untoward effects.

H. H. S.

SMILLIE (W. G.) & PESSÔA (S. B.). **A Study of the Anthelmintic Properties of the Constituents of the Oil of Chenopodium.**—*Jl. Pharm. & Experim. Therap.* 1924. Dec. Vol. 24. No. 5. pp. 359–370. [8 refs.]

Experiments were undertaken, first, to establish the active anthelmintic principle of oil of chenopodium, and secondly, to determine the optimum dosage and method of administration. The chemical composition of the drug is found to be: (1) Ascaridole, varying in different samples from 45 to 70 per cent. (2) Ascaridole glycol and ascaridole glycol anhydride, about 5 per cent. (3) A mixture of terpenes—cymene, terpene, oil of phellandrine, limonene, etc.—making together about 30 per cent. of the whole.

It was found that the lighter hydrocarbons, containing no ascaridole, have little anthelmintic power and only a slight toxic action on dogs. Ascaridole is the active principle and is toxic, causing in man nausea, headache, giddiness, tingling and numbness in the extremities, singing in the ears and drowsiness. If the ascaridole is transformed into its glycol and anhydride, as it is by the action of heat, the toxic effects are greatly reduced but its anthelmintic powers are lost altogether. Owing to the variability in the amount of ascaridole present in different samples of oil of chenopodium the active principle itself is better than the whole drug, but it is expensive.

As regards dosage, 1 cc. was found to be the best for adults, given on an empty stomach and followed in half an hour by a saline purge of magnesium sulphate. Ninety-five per cent. of the hookworms were thereby expelled, the majority being *Necator*. *Ancylostoma* was found to be more resistant to the drug. The effects proved better when the ascaridole was given as a single dose than when divided into two or more smaller doses.

H. H. S.

KREITMAIR (Hans). **Ueber Digenea und das daraus hergestellte Wurmmittel Helminal.** [Digenea and the Vermifuge obtained from it.]—*Muench. Med. Woch.* 1925. Jan. 9. Vol. 72. No. 2. pp. 56–57. [10 refs.]

Digenea simplex, the source of helminal, is a red alga found on the coasts of Eastern Asia. The author tested the action of helminal on various worms *in vitro*, namely, *Nematoxys ornatus* of the frog, *Lumbricus terrestris*, Ascaris from the pig and *A. mystax*. With a concentration of the dried extract of 1 in 10,000 the worms became more lively in their movements, trying to raise their heads out of the fluid, and some might even escape from the container. In larger doses a convulsive effect was produced. There is a wide margin of safety in the use of this drug, for by animal experiment it was found that 10 gm. of a concentrated extract per kilogramme body weight proved quite harmless to the host.

H. H. S.

WERNER (F.). **Vergleichende physiologische Studien ueber die Wirkung von Helminal.**—*Klin. Woch.* 1925. Feb. 12. Vol. 4. No. 7. pp. 311–312. With 1 text fig. [5 refs.]

The author tested helminal by subjecting it to the same experiments as TRENDELENBURG carried out for santonin, and noting the effect of various dilutions of the drug in Ringer's solution on isolated strips of muscle of the *Lumbricus terrestris*. With santonin there was an increase of tonus, of the degree and of the rate of contraction of the muscle. Helminal, on the contrary, had none of these effects, and therefore, it is stated, the claims made from the pharmacological point of view as to its efficacy cannot be substantiated for this as for santonin.

H. H. S.

KHALIL (M.). **The Control of Bilharziasis in Egypt.**—*Reports and Notes of the Public Health Laboratories, Cairo. No. 6.* 1924. pp. 95–157. With 1 plate. [18 refs.]

In addition to the measures recommended by LEIPER for the control of this disease in Egypt, Khalil has examined the effects of copper compounds on the intermediate host. He finds that copper sulphate in very high dilutions is fatal to snails ; but if his laboratory experiments are confirmed in the field, a concentration of one in two to three hundred thousand will be necessary, owing to choking of drains with vegetation. Colloidal copper in a dilution of 1 in 4 million of Nile water was found to kill all molluscs in three days.

Khalil finds that copper sulphate in a dilution of 1: 100,000 has no effect on the germination of cotton, maize and wheat. He recommends the use of copper in the pools left in the dry irrigation channels. His other recommendations agree with those of LEIPER (1918).

T. W. M. C.

KHALIL (M.). **Parasitic Diseases at Saft el Enab Village.**—*Reports and Notes of the Public Health Laboratories, Cairo. No. 6.* 1924. pp. 159–182. With 10 plates.

The village of Saft el Enab was the scene during 1922 of a serious outbreak of what Khalil shows was intestinal bilharziasis. A systematic examination of the stools and urine of the inhabitants was made and ten species of helminths were recognized. Only 4·4 per cent. of the inhabitants were free from infection ; 73 per cent. harboured *S. haematobium*, 34·7 per cent. *S. mansoni*, 64 per cent. ascarids, and 16·6 per cent. *A. duodenale.* The other parasites, found in small numbers only, are hymenolepis, taenia, enterobius, trichocephalus, trichostrongylus and strongyloides.

Khalil considers that the deaths which were the cause of the investigation were due to a superimposed heavy infection with intestinal bilharziasis or to a secondary bacterial infection following on this. Anti-bilharzia measures are being adopted on his recommendation. He points out that sufficient attention is not paid to the mortality due to bilharziasis, and that as the disease is chronic the deaths are not noted by the Medical Officer of Health.

T. W. M. C.

CAWSTON (F. G.). **Some Observations on the Source of Bilharzia Infection and the Combined Treatment of a Case in Natal.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 1. Vol. 27. No. 21. pp. 283–284. [5 refs.]

After referring to the occurrence of *S. bovis* in *Physopsis africana* in Natal and drawing attention to the fact that the curious spindle-shaped bilharzia egg noticed in a Madras Indian by CHRISTOPHERS and STEPHENS may have been derived from infection acquired during early residence in Natal, the author discusses the probability that *S. bovis* is an occasional parasite of man in Africa. The variations seen in the ova of *S. haematobium* may be associated possibly with varieties of the adult worms. Clinical records tend to show that the sodium salt of antimony tartrate takes a larger dose to effect cure than the potassium salt, while the latter is practically without toxic effects when freshly dissolved in a small quantity of saline and given in doses of ½ gr. to 1½ gr. The combination of emetine and tartar emetic does not appear to increase the toxicity of either drug appreciably.

R. T. L.

CAWSTON (F. G.). **Bilharzia in Natal.** [Correspondence.]—*S. African Med. Rec.* 1924. Nov. 8. Vol. 22. No. 21. p. 510.

Although fresh-water snails are swept down the Natal rivers in large numbers few instances of infection occur from bathing in the lagoons at the mouths of these rivers. The author explains this by the following facts :—(1) Lagoon-crabs feed ravenously on fresh-water snails ; (2) Water weeds that thrive in semi-salt water are not favourable to the life of the normal inhabitants of fresh-water pools ; (3) Few of the snails are infected, because the rains which wash them down occur at the end of the winter months ; (4) The tidal sea-water rapidly kills both the cercariae and fresh-water snails.

H. H. S.

CAWSTON (F. G.). **A Search for Intermediate Hosts and a Study of their Radulae.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 1. Vol. 28. No. 1. pp. 14–15. With 3 text figs.

Schistosomiasis appears to be diminishing in Natal owing to the more thorough treatment of infected persons and to measures taken to warn school children as to the ways in which the disease is contracted. There is also apparently a seasonal variation in the degree of infestation of fresh-water snails. Specimens of *Burnupia* have been found to harbour *Cercaria constricta.* Owing to the general similarity between various species of Burnupia and some other schistosome carriers the author suggests that for the better identification of the different hosts of Schistosoma a careful study of the radulae should be undertaken, since they differ greatly in various groups. In order to do this the radula should be separated, cleaned, and examined under a one-twelfth magnification.

H. H. S.

BERTRAND. **Contribution à l'étude de la bilharziose au Congo Belge.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. pp. 254–255.

Many of the natives employed in the mines of Upper Katanga are infected with schistosomes. Most of them are carriers of *S. mansoni*, but some have *S. haematobium.* No autochthonous case has yet been found; the patients bring the infection with them from Kabinda and Northern Rhodesia. Cure is rarely obtained with less than a total of 2–2·5 gm. of tartar emetic, and many need 3 gm. Though some patients will tolerate 10 cgm. daily, the author finds 5–6 cgm. better borne and giving equally good results.

H. H. S.

FAUST (Ernest Carroll). **The Reactions of the Miracidia of** *Schistosoma japonicum* **and** *S. haematobium* **in the Presence of their Intermediate Hosts.**—*China Med. Jl.* 1924. Nov. Vol. 38. No. 11. pp. 906–913. With 1 plate. [5 refs.]

Whereas the miracidia of *S. japonicum* rise and maintain themselves within a few millimetres of the surface of water those of *S. haematobium* distribute themselves uniformly throughout the medium. These biological phenomena are related to the habits of the respective intermediate hosts. "Although the host-parasite mechanism is based on a precise adjustment the miracidium is capable of a very wide accommodation as regards temperature and H-ion concentration."

R. T. L.

SHOUSHA (A. T.). **Complement Fixation Reaction in Bilharziasis by the Use of** *Fasciola hepatica* **Extract as an Antigen.**—*Reports and Notes of the Public Health Laboratories, Cairo. No. 6.* 1924. pp. 191–193. [5 refs.]

Experiments made with alcoholic and with ½ per cent. carbolic saline extracts of *Fasciola hepatica*, used as antigen for complement fixation tests, gave positive results in only 71·1 per cent. and 67·6 per cent. respectively of cases known to be infected with bilharzia. Shousha concludes that the large number of negative results limits the diagnostic value of the test.

T. W. M. C.

BLACKLOCK (D. B.). **Report on an Investigation into the Prevalence and Transmission of Human Schistosomiasis in Sierra Leone.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* Appendix XI. pp. 80–87. With 5 figs.

The author examined the faeces of 134 males and 54 females and concluded that infection by *S. mansoni*, if existing at all in this region, is very rare. Urinary examination, however, of 668 males and 140 females revealed ova of *S. haematobium* in 199 of the former (29·7 per cent.) and 106 of the latter (75·7 per cent.). Among the 668 there were 360 between the ages of 3 and 10 years and 81 cases of infection were found in them, or 22·5 per cent. Improvement rapidly followed intravenous injection of antimony, but the patients could not be persuaded to continue treatment after the disappearance of the main symptoms. Of snails examined for cercariae a species of Physopsis was the only one found to harbour those of *S. haematobium*. 1,557 specimens were dissected; 306 contained cercariae and 184 those of *S. haematobium*. It is shown that the infection-rate was directly proportional to excretal contamination of the village water-supply, so that a modification of the latrine arrangements should result in a marked diminution of human schistosomiasis. A brief account is given of the bionomics of this Physopsis, showing that it has considerable powers of resistance to drying.

It is suggested that a demonstration campaign should be undertaken in a badly infested village. This should comprise provision of a pure drinking water supply, a method of disposal of excreta away from water, a snail-free bathing and washing place, and the treatment of polluted waters.

H. H. S.

INGRAM (A.). **Note on a Possible Intermediate Host of** *Schistosoma haematobium* **in the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 265–266.

The Bullinus-like snails found in collections of water near Accra, Gold Coast, are: *Isidora forskali, Physa waterloti* and *Physopsis globosa.* Attempts to infect rats experimentally with the furcocercous cercariae, which occurred naturally in the *P. globosa* to the extent of 1·2 per cent. and in 14 out of 25 survivors of a stock experimentally submitted to infection with miracidia of *S. haematobium*, were all negative, but this species appears to be the probable intermediary on the Gold Coast.

R. T. L.

PATANÉ (Carmelo). **La bilharziosi in Cirenaica. Due nuove osservazioni interesse di una locale inchiesta malacologica conforme alle esigenze delle moderne acquisizioni su l'etiologia delle schistosomiasi umane.**—*Ann. di Med. Nav. e Colon.* 1924. July-Aug. Year 30. Vol. 2. No. 1–2. pp. 1–19. With 1 fig. & 2 plates. [14 refs.]

Very little is known concerning the molluscan fauna of Cyrenaica. In the tableland, over 620 metres above sea-level, bilharziasis is not endemic. In the region of Derna numerous examples of Bullinus were found living in irrigation channels and ponds which originate in the wadis running the whole year across the country. Here, too, *Planorbis atticus* occurs. Nothing definite can be reported regarding the coast region owing to the scanty semi-nomadic population. It is nevertheless remarkable that Cyrenaica enjoys, in spite of its nearness to Egypt, immunity from *S. mansoni*. The author records two cases of *S. haematobium* in young natives of Derna, acquired apparently from bathing in Ras-el-Ain in Derna.

R. T. L.

FELIX (A.). **Observations on Vesical Bilharziasis in Palestine.**—*Amer. Jl. Trop. Med.* 1925. Jan. Vol. 5. No. 1. pp. 41–61. [21 refs.]

Bilharziasis is stated to have been endemic in Palestine for a great length of time and *not* disseminated in the country during the war

by the Egyptian Labour Corps. In the Orphanage at Jaffa 43 per cent. of 53 children between the ages of 9 and 14 were found to be infected with *S. haematobium.* The only possible sources of infection were the river Auja, its tributaries, and the reservoirs supplying the irrigation systems of the orange groves. In the Jewish agricultural School at Mikveh Israel 13 per cent. of 158 boys, between the ages of 14 and 18, were also found infected. These results led to a general examination of school children in the Jaffa area, and 4·3 per cent. out of 1,256 children were shown to be positive and a further 6·7 per cent. were "suspect." The author does not accept the conclusions of BUXTON and KRIKORIAN that the disease is dying out, for he has evidence that well authenticated cases of new infections were acquired in 1922 and that the creation of new agricultural settlements within range of infected streams is likely to result in an extension of the disease. In the course of 2,400 microscopical tests of faeces two cases of *S. mansoni* were noted, but in both there was a possibility that the infection had been acquired outside Palestine. It is recalled that *Planorbis boissyi* has not yet been found in Palestine. The diagnosis of slight vesical cases frequently presents serious difficulties; eosinophilia fails as a positive test. In these cases the complement fixation-test as applied by FAIRLEY acquires particular significance. Subcutaneous injection of emetine never resulted in permanent cure, while tartar emetic intravenously injected never failed.

R. T. L.

DIMITRACOFF (C.). **Un cas de bilharziose vésicale Européenne.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Jan. 1. Year 40. 3rd Ser. Vol. 48. No. 39. pp. 1771-1774. With 1 text fig.

A case of vesical bilharziasis was seen at the Therapeutic Clinic in Sofia, Bulgaria. The patient originally came from the village of Houbavéné, Bulgaria, but served in Macedonia and in France during the war. A photograph in the text shows that the eggs passed in the urine were typical *S. haematobium* ova.

R. T. L.

HOLLAND (E. P.) & WOODWARD (E. A.). **A Case of Bilharziasis Endemic in Australia.**—*Med. Jl. Australia.* 1924. Dec. 6. 11th Year. Vol. 2. No. 23. p. 606.

A brief note is made of the occurrence of bloody urine containing eggs of *S. haematobium* in a boy, aged 3 years, who was born and had always lived in the same house in Grafton, New South Wales. Since the age of 18 months the boy had frequent bleedings from the rectum. The authors state that a number of eggs were " twice to three times as large as the typical ones, spherical, the clear capsule much thicker, the spine missing, and the ovum seemed to show signs of commencing degeneration. One cell bore a lateral spine." [No hint is given of the possible source of the infection.]

R. T. L.

PIRIE (J. H. Harvey). **Bilharzial Appendicitis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 210-213. [7 refs.]

The author shows that conditions of appendicitis, more particularly chronic appendicitis, associated with and probably due to schistosome infection are not so rare as has been supposed. Thus during the five years 1919–1923, twenty appendices have been sent to him which on examination proved to be more or less heavily infested with ova of *S. haematobium.* These ova were most abundant beneath the serous surface and agglomerations of them produced small white nodules, not uncommonly mistaken for tubercles, though the latter are less hard, glistening and porcelain-like than *schistosoma* "tubercles." Giant cells are seen in both.

H. H. S.

SPEDENER. **Note sur le traitement de la bilharziose par l'émétique.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. p. 256.

The author formerly was accustomed to treat schistosome infection by 30 injections of tartar emetic, giving 1 gr. daily, but the occurrence of two deaths and of untoward symptoms in others led him to conclude that this method was too energetic. He now gives a course of five injections of the antimony, then a dose of 606 and waits for eight days before renewing the former drug. The total amount of 30 gr. is maintained. The results are quite satisfactory.

H. H. S.

SHARP (C. G. Kay). **Treatment of Schistosomiasis. A Review.**—*Med. Jl. S. Africa.* 1924. Sept. Vol. 20. No. 2. pp. 30–34. [32 refs.]

A critical review of the methods of treatment of schistosomiasis during the last nine years. The greater part is naturally devoted to the use of tartar emetic ; the history of its employment, the untoward symptoms which may arise, and the dosage recommended are dealt with in the chronological order of the published papers on the subject. The use of emetine and the work of CAWSTON are described separately, because this work was concerned with South Africa in particular. The subject is clearly summed up by the author in the following words :—

" I have examined the urines of a large number of children in the schools in Natal, who have undergone a course of emetine treatment . . . and I have found that many of these cases pass viable ova in the urine although all the symptoms of bilharzia disease, so far as the patient can observe, have been absent since the cessation of treatment, the period varying from a few months to two years. The foregoing review of the treatment can leave no doubt as to the efficacy in the large majority of cases of the intravenous injection of tartar emetic in adults and emetine in children, but from my experience of the cases of children who have received a course of emetine treatment, and in whose urine I have so often found viable ova, although there has been no risk, so far as I could ascertain, of reinfestation, the pronouncement of a cure should be made with some diffidence until a sufficient time, say six months, has elapsed since the cessation of treatment, and repeated examinations of the early morning urine have been carefully made."

H. H. S.

HARKNESS (A. H.). **Intravenous Antimony Treatment of Bilharziasis and other Infections.**—*Jl. Clin. Res.* 1923. Apr. Vol. 9. No. 2. pp. 55–58.

Brief accounts are given of two cases of urinary schistosomiasis. The first patient, who had become infected 17 years previously in South Africa, had been treated with urinary antiseptics, vesical irrigations and emetine in full doses without lasting effect. Sodium antimony tartrate was then administered intravenously, and after 10 gr. had been given there was great improvement, but injections were continued to a total of 25 gr. At the time of writing, two years later, there was neither blood, albumin, nor ova present in the urine. The second case is instructive in that the condition was diagnosed as gonorrhoea owing to a urethral discharge and frequency of micturition following exposure to venereal infection; similar symptoms had occurred two years earlier when the patient was in India. This case, too, proved to be bilharzial and cleared up with intravenous administration of antimony. An interesting point is the fact of the infection having been contracted probably in India.

H. H. S.

CAWSTON (F. G.). **Antimony Tartrate in Bilharzia.** [Correspondence.] —*Lancet.* 1924. Oct. 18. pp. 831–832.

The author recommends the employment of the potassium salt of antimony in preference to the sodium salt on the grounds that, when dissolved in boiling saline, it has no toxic effect and that a smaller total amount is required. This last is of particular importance when there is considerable destruction of liver tissue, as, for example, in infection by *Schistosoma japonicum.*

H. H. S.

ITURBE (Juan). **Some Data concerning the Life Cycle of the** *Schistosoma mansoni.* **Distribution and Prophylaxis of Schistosomiasis in Caracas.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 428–437. [11 refs.] [United Fruit Company, Boston, Mass.]

——. **Data concerning the Cycle of** *Schistosoma mansoni.*—*Southern Med. Jl.* 1925. Jan. Vol. 18. No. 1. pp. 34–38.

. The commonest molluscs in the Caracas Valley are *Ampullaria luteosoma, Physa rivalis, Planorbis cultratus* and *P. guadelupensis.* The last mentioned species is the intermediate host of *Schistosoma mansoni* in Venezuela. Up to 1916 *S. mansoni* was observed in Caracas to an alarming extent. The mollusc lives and thrives in pools constantly forming in the bed of the river Guaire in the very thin subterraneous stratum contiguous to the alluvial soils of the river; the sluggish irrigation canals also serve as its home. The majority of the inhabitants take water for domestic purposes from these two sources, and 150 out of 1,000 specimens of mollusc collected proved to be naturally infected. Since RISQUEZ published in 1916 statistics from the Hospital Vargas showing an infection rate of 28 per cent. there has been a marked decrease. At present the infection occurs in only 5 per cent. of the patients. The author's personal statistics show 5 cases out of 600 persons whose faeces were microscopically examined. This change is attributed to propaganda and preventive and curative measures, the latter comprising prohibition of cultivation of the lands bordering the river Guaire or of its further irrigation and the systematic use of tartar emetic.

R. T. L.

FAUST (Ernest Carroll) & MELENEY (Henry E[illegible] **Studies on Schistosomiasis japonica. With a Supplem[illegible] [illegible]e Molluscan Hosts of the Human Blood Fluke in China a[illegible] and Species Liable to be confused with them,** by Nelson [illegible]ALE.—*Amer. Jl. Hyg.* Monographic Series. 1924. Mar. No. 3. 339 pp. With 36 plates & 25 text figs.

——. **Schistosomiasis in China: Biological and Practical Aspects.**—*Lancet.* 1924. Jan. 5. pp. 21–24. [23 refs.] & *Proc. Roy. Soc. Med.* (Section Trop. Dis. & Parasit.). 1924 Mar. Vol. 17. No. 5. pp. 31–42. With 1 plan. [23 refs.]

The "Studies on Schistosomiasis japonica" forms a beautifully illustrated and printed addition to the Monograph Series of the *American Journal of Hygiene.* It covers 340 pages and is illustrated by 36 plates, 25 text figures and numerous diagrams. After a brief introduction and an historical sketch the bulk of the work falls under seven main divisions dealing respectively with (*a*) morphology, biology and life history of *S. japonicum*; (*b*) the route of migration of the young parasite in the body; (*c*) the intermediate hosts, (*d*) the distribution of schistosomiasis in the Orient; (*e*) pathological anatomy; (*f*) clinical aspects in man and animals; (*g*) prophylaxis. There are also appendices comprising an essay on the classification of the Chinese carriers by Dr. Annandale and a detailed bibliography.

The egg of *S. japonicum* as found in the faeces is an oval object with an average length of 89μ and a breadth of 66μ. The wide differences recorded by various observers are due to degree of maturity of the egg measured. The phenomena of hatching depend on the maturity of the miracidium and increased internal tension associated with hypotonicity and absence of fermentative agents in the medium. The miracidium escapes through a longitudinal split in the shell usually opposite the spine. It survives as a free-swimming body for a period of from 60 to 72 hours. Infection of the intermediate host occurs in the surface layer of the water indicating a delicate adjustment to the habits of the snail. The course of development within the snail has been traced for a period of 47 days. The miracidium enters by penetrating to the blood stream through the gill filaments or by piercing the tissues of the head or foot and attaining the lymph sinuses. About the seventh day the miracidium loses its characteristics and after three weeks becomes an elongated spinose sac containing the morula stage of secondary sporocysts. The worms have gradually passed from the lymph spaces surrounding the salivary glands to the region of the nephridia and continue to pass still further distad. At the commencement of the fifth week the larvae have become differentiated into primary sporocysts about 400μ in length and contain elongating secondary sporocysts. A week later the worms have reached the lymph spaces between the liver and gonads and the mother sporocyst has ruptured, releasing the daughter sporocysts which contain the germ balls of the cercariae. At the end of seven weeks these secondary sporocysts measure 250μ by 40μ and contain differentiated cercariae. The final differentiation also take place in the lymph spaces, for the larval worms never break into the liver or gonidial tissue except by accident. The cercariae vary in measurements due to maturity, contractibility, differences in nutrition and intrinsic size variation. The excretory system is of generic, *not* specific value. There are five pairs of cells in the cephalic glands; as they mature they change from basophilic to oxyphilic. The genital *anlage* is undifferentiated in the cercariae. After infection of the definitive host sex differentiation is recognizable on the sixth day; mating occurs on the 17th day although sexual maturity is not reached until the 30th day. In the mature male the number of testes is consistently seven.

The chapter dealing with the route of migration is devoted to an account of experiments which confirm MIYAGAWA'S contention that the main course taken by the young forms of *S. japonicum* from the lungs to the liver is by way of the pulmonary veins, the arterial circulation, the gastro-intestinal capillaries and the mesenteric and portal veins. The possibility that larvae from the lung in advanced state of development could penetrate the stomach mucosa was eliminated experimentally.

Chapter IV deals with the discovery of the molluscan hosts of *S. japonicum*. In the neighbourhood of Soochow and afterwards in other regions this proved to be *Oncomelania hupensis*, a form very similar in appearance and habitat to *Katayama nosophora*, which species was found to occur in the Shaohsing area and was afterwards collected also in the Pearl River delta in South China.

Chapter V gives detailed information regarding the limits of the endemic areas for schistosomiasis in Central and South China. While the Yangtze Valley is the major centre of infection, it is stated that "the main course of the stream is not known to be responsible for a single case of infection." Reservoir hosts in China appear to be dogs, although native dogs are only slightly infected, cats and imported cattle. Native oxen are reported to be immune. Horses are not used in the endemic regions and donkeys are rare. It is considered that in China man alone is the important definitive host.

Chapter VI deals with pathological anatomy. The invading cercaria produces a local reaction characterized histologically by oedema, congestion and leucocytic infiltration in the skin. In its passage through the lung and later the alimentary tract the chief lesions produced by the young worm are haemorrhages. In massive infections of the liver there is necrosis of the parenchyma and a degeneration of the convoluted tubules of the kidneys due apparently to toxins. Polymorphonuclear leucocytes, chiefly eosinophiles, congregate around the eggs in the tissues and abscesses form. These breaking outwards by small openings into the mucosa result in the cavities becoming lined by the proliferating epithelium. This is, in the authors' opinion, an important factor in the development of intestinal papillomata. Thrombosis of the larger mesenteric and portal veins is frequently seen in late cases. In the liver there is in addition to the lesions produced by the local deposition of eggs a general pipe-stem cirrhosis of the large and small branches of the portal veins. The spleen varies greatly. It may be hugely hypertrophied. Eggs may be found in the pancreas and spleen. Lung lesions are insignificant. In rare cases eggs may cause Jacksonian epilepsy, but how they reach the brain is difficult to determine.

In chapter VII the clinical manifestations are described under three headings: those associated with skin infection, the stage of acute local symptoms due to egg-deposition and extension and the stage of cirrhosis of the liver due to tissue proliferation and repair. It is noted that the blood-serum globulin is twice as high as usual, and the "globulin precipitation test" and "aldehyde test" regarded previously as specific for kala azar were found to be strongly positive in many cases. Antimony tartrate in a total dosage of 1·5 to 2 gm. in 18 to 20 days proved curative.

In a final chapter the question of prophylaxis is discussed. In China the problem is extremely complex. It is not merely one of public health but involves economic and political questions. At the present time it seems unwise to recommend in China the extirpation of the intermediate host owing to the extent of its distribution. The authors recommend:—

(*a*) Control of faeces disposal.
(*b*) Avoidance of exposure to infection.
(*c*) Specific treatment by out-patient clinics.
(*d*) Educational propaganda.

In an Appendix by the late Dr. N. Annandale the molluscan hosts in China and Japan and species liable to be confused with them are dealt with. Dr. Annandale regarded *Hemibiae* and *Katayamae* as mere sections of Oncomelania, distinguished by the fact that the shells of the species included in the former have vertical ribs, while those in the latter have not. He recognized five living species of Oncomelania: (1) Shell smooth, *O. formosana, O. nosophora*; (2) Shell with vertical ribs, *O. sublaevis, O. longiscata* and *O. hupensis*. Of these *O. sublaevis* and *O. longiscata* are doubtful species, so that all the accepted species of *Oncomelania* are now known to be carriers of *S. japonicum*.

R. T. L.

Tai (J. T.). **A Preliminary Report of Cases of** *Schistosoma japonicum* **Infection.**—*Nat. Med. Jl. China.* 1924. Dec. Vol. 10. No. 6. pp. 370–376.

The subject of infection by *Schistosoma japonicum* in Yangchow and its neighbourhood is briefly presented in this preliminary paper. Exposure occurs in working barefoot in irrigated rice-fields, fertilized mainly by human excreta. Of 400 persons whose faeces were examined 28, or 7 per cent., were found positive. Patients came from all the surrounding areas except the north-west, where the ground is more elevated and irrigation and chance of infection less. Many cases were of two years' duration or more, and in them treatment by intravenous antimony did not bring about much benefit [though it must be stated that the duration of treatment was very brief, a fortnight or less in most instances]. Patients coming early under treatment, before there was much in the way of symptoms or constitutional disturbance, improved more rapidly. Two of them, after four and seven injections respectively (the injections being given three times a week), "showed no schistosome eggs in the faeces on three successive examinations at intervals of several days."

H. H. S.

Meleney (Henry Edmund). **Schistosomiasis japonica in the United States Navy.**—*U.S. Nav. Med. Bull.* 1924. Nov. Vol. 21. No. 5. pp. 630–636. [9 refs.]

A case of schistosomiasis is reported in a member of the United States Navy who went hunting in the Yangtze Valley on 16th, 23rd and 24th May, 1923. He wore shoes, socks, canvas puttees and woollen trousers and waded about in ponds and canals. No itching, fever or urticaria was experienced, but 26 days after the last date he began to feel feverish at night and had severe pains in the back and calf muscles. On 22nd June no eggs could be found in the faeces by the brine flotation method, but the blood showed 17 per cent. eosinophilia, which increased to 23 per cent. two days later. On 14th July the eosinophilia stood at 38·7 per cent., and the blood serum globulin precipitation test was (2 plus) positive. Eggs of *S. japonicum* were found in fresh smears of faeces.

Treatment with sodium antimony tartrate was started on (circa) the 54th day after infection. After the seventh dose (a total of 0·95 gm. of the drug) no more eggs were found. The last treatment was given on the 17th day. Nine days later the eosinophile cells were 29 per cent., but the patient had gained 5 lbs. in weight and was in excellent general condition. On 19th June, 1924, the eosinophiles were 1 per cent., the blood globulin test negative, and the faeces contained no ova.

As the eggs are permeable the brine flotation method is inapplicable, as it causes marked shrinking. The most accurate method is to wash the faeces and hatch out the miracidia. The use and value of the blood serum globulin precipitation test during treatment is emphasized.

R. T. L.

CULLEN (J. P.). **Human Schistosomiasis in India.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 15. Vol. 27. No. 24. pp. 337–338.

The author recorded in July, 1924, the first case of infection by *S. japonicum* in Burma. He now records 8 others, 6 of them natives of Yunnan. One was treated by tartar emetic, and after a total of 12 grs. had been given ova disappeared from the faeces. The other patients were considered to be too far advanced for specific treatment.

Attention is drawn to the fact that Asiatic schistosomiasis is more widely spread than the text-books would lead us to suppose, and the author advises accurate determination of the distribution of the disease with a view to preventive measures.

H. H. S.

NISHI (Michitomo). **Experimental Study on the Treatment of Schistosomiasis Japonica with Tartar Emetic. Clinical Observation, Histological Investigation and Pathological Changes on Animal Intoxicated with Tartar Emetic.**—*Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1923. Vol. 2. pp. 485–501. With 1 plate. [61 refs.] and *Japan Jl. Experim. Med.* 1923. June. Vol. 7. No. 7.

The effect of tartar emetic on the adult worms and eggs of *Schistosoma japonicum* in the host's tissues has been studied experimentally in dogs, the sodium salt of tartar emetic being used, as it contains the same amount of antimony as the potassium salt yet is less toxic.

Injections given shortly after dogs had been experimentally infected with cercaria showed that the drug is able to kill the young schistosomes and, consequently, prevent an attack of schistosomiasis. The therapeutic dose of the sodium salt for dogs proved to be 0·001–0·005 gm. per kilogram of bodyweight, thus conforming with the dose of the potassium salt as determined for man. With doses of 0·005 gm. per kilo a few atrophied worms only were found in the portal vein. Degeneration and necrosis were seen in every kind of parenchymatous cell, viz., nerve, flame and other matrix cells of the adults. In the ovary vacuolation occurred. The yolk glands were also affected, likewise the testes. The body colour differs from the normal markedly and tends to be grey or whitish owing to lack of pigment in the intestine. The changes in the eggs in the tissues are also described.

R. T. L.

TANAKA (Shyuji). [**On the Thermal Resistance of the Cercaria of** *Schistosomum japonicum* **and also on the Infection by Bathing in Warm Water.**]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. Nov. No. 2393. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 41.]

The usual temperature of the bath water used by the Japanese is 43°-47° C., the optimum being 45°-46° C. In such warm water the cercaria of *S. japonicum* would be unable to infect the human body. If, therefore, bath water is cooled by well-water, not by river-water, or if the heating of river-water should have been continued for more than five minutes before the person uses the bath no danger of infection would be incurred.

R. T. L.

LUDLOW (A. I.). **Inguinal Hernia : Ova of** *Schistosoma japonicum* **in Hernial Sac.**—*China Med. Jl.* 1924. Oct. Vol. 38. No. 10. pp. 829-832. [9 refs.]

A Korean male, 70 years of age, was operated upon for double inguinal hernia extending into the scrotum. About a week later the left side of the scrotum began to swell, and on two occasions bloody fluid was evacuated from it, after which healing took place. Section of tissue from the sac showed that it was of a granulomatous nature with a thick fibrous capsule. The tissue contained ova of *S. japonicum* in large numbers. This is said to be the first case of *S. japonicum* infection recorded in a Korean and the first in which the condition was connected with a hernial sac.

H. H. S.

i. CHRISTOPHERSON (J. B.). **Le traitement prophylactique de la bilharziose. Communication faite au Congrès britannique d'hygiène tenu à Bordeaux le 5 juin 1924.**—*Rev. Méd. et Hyg. Trop.* 1924. Aug.-Dec. Vol. 16. No. 6. pp. 173-177.

ii. CAWSTON (F. G.). **"Bilharzia," a Paper for the Practitioner.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp. 322-326.

iii. LOTSY (G. O.). [**Bilharziosis und Calculosis.**]—*Fortschr. a. d. Geb. d. Röntgenstrahlen.* 1924. Vol. 32. pp. 546-554. [Summarized in *Med. Sci. Abstr. & Rev.* 1925. Mar. Vol. 11. No. 6. p. 484.]

iv. SHARP (C. G. Kay). **Schistosomiasis in Natal.**—*S. African Med. Rec.* 1924. Oct. 25. Vol. 22. No. 20. pp. 471-474.

v. PUGH (Winfield Scott). *Schistosoma Haematobium* **Infection and its Relation to Persistent Urinary Sinus.**—*Boston Med. & Surg. Jl.* 1924. Nov. 6. Vol. 191. No. 19. pp. 873-875. [30 refs.]

vi. TSYKALAS. **Notes sur la bilharziose intestinale.**—*Rev. Méd. et Hyg. Trop.* 1925. Jan.-Feb. Vol. 17. No. 1. pp. 15-22.

i. The author reiterates his well-known views on the relative merits of treatment of schistosome patients and carriers and the destruction of schistosome invertebrate intermediaries in the eradication of the Bilharzia disease.

ii. A short elementary account of bilharzia infection and its etiology, diagnosis and treatment based upon South African experience and addressed to the practitioner in South Africa. In thick boards it is issued as a separate publication.

R. T. L.

iii. By the use of soft radiation and a small diaphragm radiological diagnosis of schistosome infection can be carried out in the stages of ulceration and fibrosis, and of scarring, stricture and obliteration. It is less satisfactory in the stage of infiltration with ova in which there are merely sessile infiltrations and papillomata.

iv. The prevalence of urinary schistosomiasis in Natal varies from less than 3 to about 10 per cent. in school-children. In Durban among a male school population of 5,000 the incidence, based on recorded cases, is 2·4 per cent.

v. Two cases of infection with *Schistosoma haematobium*, one with a urethral, the other with a renal sinus, were treated with tartar emetic intravenously and recovered. The rest of the paper contains nothing fresh, except mistakes, which are numerous.

vi. The author reports, as if it were new, that lateral-spined ova may be found in the urine and terminal-spined ova in the faeces. For treatment of schistosomiasis he favours emetine in large doses of 0·1-0·17 gm., and a total of 1-1·2 gm. intravenously in six days. The risk of toxic effects, he finds, are less when large doses are given.

H. H. S.

OHI (Tsukada). [**On the Infection by** *Fasciolopsis buski* **(Lankester) among the Japanese. On the Infection's Route with the Human Body and the Pig.**]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. Nov. No. 2396. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 41.]

The author reports two cases of infantile infection by *Fasciolopsis buski* among the Japanese. The infection came perhaps from eating the raw seed of water plants which the inhabitants of Southern Formosa are accustomed to do. [This is apparently the first record of this parasite acquired by man in Formosa—see SUZUKI *infra.* Hitherto the pig has been considered the sole definitive host there, and some have questioned the identity of the porcine species with that in man.]

R. T. L.

SUZUKI (Sotowo). [**On the Human Infection by** *Fasciolopsis buski* **in Formosa.**]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. Dec. No. 2399. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 42.]

——. **Human Cases of** *Fasciolopsis buski* **found in Formosan Natives.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1925. Jan. No. 238. English summary pp. 6–7. [In Japanese.]

Among 228 school children in a town in the southern part of Formosa the author found 1·75 per cent. infected with *Fasciolopsis buski.*

R. T. L.

HARA (Chikawo). [**Report on Pulmonary Distomiasis in Keishyo-Nando Prefecture, Korea.**]—*Chosen Igakkwai Zasshi* (*Jl. of Korean Med. Soc.*). 1924. Sept. No. 49. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. pp. 44–45.]

In the province of Keishyo-Nando the author examined for paragonimiasis 11,139 out of the total population of 26,157. 118 carriers of Paragonimus were found, " the maximum percentage . . . in the villages being 12·87 per cent., the minimum 9·23 per cent. and the average 1·42 per cent."

R. T. L.

KONDO (Kiichi). [**Antimony Treatment of Paragonimiasis.**]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. Aug. & Sept Nos. 2383, 2384 & 2385. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. pp. 326–327.]

Stibnal given to 19 cases of paragonimiasis in repeated injections totalling 0·9-1·8 gr. resulted in a quantitative decrease and disappearance of bloody expectoration. The colour of the sputum improved. The eggs decreased numerically and eventually ceased to appear. *In vitro* experiments showed that all the eggs lost vitality after 7 days in a 1 in 10,000 solution of stibnal and replaced in clean water for 14 days. In 3 of the cases treated there were symptoms: slight dizziness, acceleration of cardiac frequency, nausea, etc., but these lasted only for a short time.

R. T. L.

CHIN EM PO. **On a Case of Irreducible Inguinal Hernia containing a Portion of the Great Omentum with a Cyst and Tubercles both caused by** *Paragonimus westermanii* **and its Eggs.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1924. May. No. 234. English Summary p. 9. [In Japanese.]

During operation on an irreducible inguinal hernia which contained a portion of the great omentum, numerous tubercles were seen on this together with a cyst of the size of a small hen's egg. These proved on closer inspection to have been caused by *Paragonimus westermanii* and its eggs. The patient was a Chinese who had complained of cough, with a dark brown sputum, since last year.

R. T. L.

HAGA (J.). **Een geval van infectie met** *Opisthorchis felineus* **bij den mensch.** [A Case of Infection with *Opisthorchis felineus* in Man.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 835–837. [2 refs.]

On one occasion during the course of an attack of amoebic dysentery in a native soldier a specimen of the stools contained two typical ova of *Opisthorchis felineus.* None has been found since.

W. J. Bais.

SHATTUCK (George Cheever). **Treatment of Clonorchiasis. Further Observations.**—*Amer. Jl. Trop. Med.* 1924. Nov. Vol. 4. No. 6. pp. 507–517. [1 ref.]

This is an interesting paper giving the results of treatment of six cases of clonorchiasis by tartar emetic and arsphenamin; three of them have been previously recorded; the other three are detailed in an appendix. Apparent cure was brought about in four of the six, judging by disappearance of ova for two consecutive months; prior to treatment these had been found with great regularity. Two cases cleared up on administration of tartar emetic alone, but, strangely enough, more rapidly in a patient who proved none too tolerant of the drug. In a third patient tartar emetic was ineffectual, but a few small doses of arsphenamin subsequently led to the disappearance of ova. It is possible, of course, that the former drug had prepared the way for the second. In another, however, the reverse of this occurred. An intensive course of intramuscular injections of sulph-arsphenamin proving unsuccessful, a few doses of tartar emetic were administered intravenously, and a cure resulted. In view of these occurrences the author suggests that it might be well to administer an antimonial and an arsenical preparation alternately or in alternating intensive courses.

H. H. S.

KATATA (Buyo). [**On the Action of Stibnal against Experimental Liver Distomiasis.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1924. Sept. Vol. 31. No. 5. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 45.]

Experimentally stibnal has been found to have a vermicidal action on *Clonorchis sinensis.* After its administration the worms were found to undergo atrophy and to lose their power of laying eggs.

R. T. L.

LE BAS (G. Z. L.). **Experimental Studies on** *Dibothriocephalus latus* **in Man.**—*Jl. Helminthology.* 1924. Sept.-Nov. Vol. 2. Nos. 4 & 5. pp. 151–166. With 7 charts in text. [7 refs.]

A most interesting paper of detailed experimental studies with *Dibothriocephalus latus* which tends to show fairly conclusively that the serious and even fatal effects of infection as recorded in text-book after text-book are due to some other factor than the presence of the parasite. The effects in three volunteers previously in good health were little more than discomforting.

Two of the three subjects swallowed four living plerocercoids each, the third a single one only. The symptoms experienced were as follows :—

A. Slight cough on the second and third days ; ravenous appetite on the ninth. A week later some irregularity of bowel action till the 21st day, when ova were found in the stools, and a troublesome diarrhoea set in which continued for 4 days. 108 days after infection three live tapeworms were passed as a result of treatment with *Filix mas.* The only after-effects were slight headache and troublesome constipation, perhaps due to removal of the previous irritation. Just prior to treatment the faeces were estimated to contain some 7,000,000 ova per gramme (dried).

B. Similar slight cough in the first three or four days, and partial loss of appetite throughout the experiment. On the 8th day colic, diarrhoea and vertigo with slight rise of temperature (99°-100° F.). Ova were found in the stools on the 15th day and diarrhoea set in two days later. Symptoms after the 24th day were negligible, until the middle of the 14th week, when feelings of faintness, giddiness, palpitation and lassitude were experienced and treatment with Male-fern resulted in the expulsion of three live worms, of an average length of 22 ft. Headache and constipation persisted for three weeks afterwards. Ninety days after infection 12,250,000 ova per gramme of dried faeces were being passed.

C. Anorexia and nausea were experienced 12 days after swallowing the plerocercoid ; on the 25th there was diarrhoea, and two days later ova were found in the stools. Subsequently, until expulsion of the worm, there were vague dyspeptic symptoms with nausea and alternating periods of diarrhoea and constipation. Treatment with carbon tetrachloride led to the evacuation of a dead worm, 11 ft. in length, but twice previously sections of the worm had been passed, 28 in. on the 40th day and 103 in. on the 82nd day. No untoward symptoms succeeded treatment in this instance, and those in the other two may have been due to the *Filix mas.* This patient was passing 12,500,000 eggs per gramme of dried faeces at the end of the fourteenth week of infection.

The symptoms in all, it is seen, were associated with the attainment of maturity of the worm. In view of the previous records the blood changes are important. In each there was a slight leucocytosis with polymorphonuclear increase in the early stages of infection, but no diminution in the number of erythrocytes [though a slight increase in the size of individual red cells was noted by Dr. PASSEY and Mr. Carter BRAINE, see below]. Eosinophilia was present, but not very high, never above 16·6 per cent.

Numerous experiments for determining intradermal, precipitin and complement fixation reactions were undertaken with various extracts, saline, alcoholic, and acetone, with different parts of the segments, but without result. No evidence could be obtained of antibody production in the sera.

H. H. S.

PASSEY (R. D.) & BRAINE (J. Carter). **The Size of the Red Cells in Dibothriocephalus Infection.**—*Jl. Helminthology.* 1924. Sept.-Nov. Vol. 2. Nos. 4 & 5. pp. 167–172. With 4 charts. [3 refs.]

The authors plotted a series of Price Jones' curves to show the distribution of the erythrocytes by size from Miss LE BAS' three cases of experimental and one of natural infection by *Dibothriocephalus latus.* The films were made about the same time each day in order to eliminate diurnal variations.

The patient with natural infection was suffering also from an attack of enteric fever and his blood showed the greater changes, the average diameter of his corpuscles being 8·04μ early in the fever and 7·66μ five weeks later. In the cases of experimental infection the diameter ranged from 6·96-7·03μ at the beginning of the experiment to 7·17-7·68μ at the end. Nine months afterwards one had returned to normal (7μ); in the others, after 15 months, the average diameter was 7·18μ. The degree of anaemia in each case was slight. Though the change was but small, it is regarded as tending to be such as is found to occur in pernicious anaemia.

H. H. S.

SALTZMANN (Fredrik). **Die Bedeutung der Wurmauflösung in der Ätiologie der Bothriocephalus Anamie.** [Significance of Disintegration of the Worm in Dibothriocephalus Anaemia.]—*Acta Med. Scandinavica.* Kristiania. 1924. Supplement VII. pp. 268–272. [1 ref.]

Three hypotheses have been advanced regarding the toxin of *Dibothriocephalus latus*: (1) That it resides in the body of the parasite and is liberated only when the worm is destroyed; (2) That it is free in the intestine of the patient, but is absorbed only when for some reason or other the permeability of the mucosa is increased; (3) That it is formed and absorbed in every case, but the toxic effects depend on some reacting or non-reacting factor in the patient. The author supports the first of these on the grounds that treatment often gets rid of part of a worm, and while the patient is improving and when general health has recovered more and larger fragments are often passed without further treatment. If, however, the worm dies and breaks up without being expelled, poison is absorbed, and is probably the cause of the pernicious anaemia.

H. H. S.

ANDO (Akira) & ASAI (Saburo). [**On the Adult Forms of the** *Bothriocephalus latus* **found Parasitic in the Domestic Dogs and Cats in Ohgaki City and Vicinity of Gifu Prefecture, and also on some Parasites.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1924. Sept. Vol. 31. No. 5. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 45.]

In the city and suburbs of Ohgaki 100 dogs and 82 cats were examined. The following helminth species were found : *Dibothriocephalus decipiens* [=? *D. mansoni*], *D. latus*, *Taenia crassicollis*, *Clonorchis sinensis*, *Metagonimus yokagawaii*, *Ascaris canis* and *A. lumbricoides*, *Trichocephalus depressiusculus*, *Ancylostoma caninum*, etc. In 3 per cent. of the dogs eggs of the *Ascaris lumbricoides* were found while in 46·3 per cent. of the cats eggs of *D. decipiens* were demonstrated.

R. T. L.

EGUCHI (Suyewo) & TAKAGI (Sampei). [**On** *Diplogonoporus Grandis* (**R. Blanchard, 1894) Luehe 1899.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1924. May. Vol. 31. No. 3. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 266.]

The English summary merely states that the authors describe minutely the morphology of the worms obtained from the sixth recorded case. There were apparently two complete worms 5·78 and 1·43 metres in length which had been collected by Dr. Takagi in the Shizuoka Prefecture.

R. T. L.

TASHIRO (Kikuwo). **Clinical, Pathologic-Anatomical and Experimental Studies on "** *Plerocercoides Prolifer* **Iijima (1905),** *Sparganum Proliferum*, **Stiles (1906)."**—*Mitt. a. d. Med. Fak. d. Kais. Kyushu-Univ.* Fukuoka, Japan. 1924. Vol. 9. No. 1. pp. 1–42. With 4 plates. [10 refs.]

Since *Plerocercoides prolifer* was first recorded by IJIMA in 1905, four further cases have been described. The present paper deals with the sixth case (excluding that of LE SUEUR, see this *Bulletin*, Vol. 21, p. 949), and all, save that of GATES in America, occurred in Japan. This larval cestode has the capacity of penetrating and traversing the host tissues, except the bones, and in the skin produces characteristic verrucous nodules and thickenings like those seen in elephantiasis. It invades also the viscera and finally causes the death of the victim. The case detailed in this report is that of a young girl in whom the first symptoms appeared in 1915 when 18 years of age, and who died in 1922. The skin of the abdomen and legs often showed indurations and abscesses. When the skin was incised living worms were usually found in pus. Moreover, the verrucous lineal nodules and elevations on the breasts, arms and upper abdomen occasionally changed position due to movement of the larval cestodes. Living worms could always be obtained for study and experiment by tearing off the tips of the nodules or elevations. Feeding experiments to ascertain the definitive host were negative, but the larvae could be transplanted. The paper includes some interesting observations on the histology of the larval worms.

R. T. L.

SCOTT (H. H.). **Stages in the Direct Development of** *Hymenolepis longior* **Baylis.**—*Jl. Helminthology.* 1924. Sept.-Nov. Vol. 2. Nos. 4 & 5. pp. 173–174. With 1 plate.

In continuation of his previous investigations on the direct development of *Hymenolepis longior* Baylis (= *H. nana*), the author fed to mice small portions of intestine of other mice, with villi containing fourth and fifth day cysticercoids in large numbers, and failed to produce infection, thus disposing of the view that the infection of the definitive host is due to the swallowing of cysticercoids passed in faeces. The plate illustrates the development of cysticercoids in the villi from the fifth to the seventh day.

R. T. L.

WOODLAND (W. N. F.). **On the Development of the Human** *Hymenolepis nana* **(Siebold 1852) in the White Mouse ; with Remarks on** " *H. fraterna,*" " *H. longior,*" **and** *H. diminuta.*—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 424–435. [13 refs.]

The author, in continuation of his previous work on the genus *Hymenolepis*, went to Lisbon, where many of the children are found to harbour *H. nana.* He took with him young mice free from infection with *H. fraterna*, and fed 30 of them with fresh *H. nana* eggs obtained from infected children, keeping 27 as controls. Seven of the 30 became infected, showing that *H. nana* is capable of developing in mice, producing worms to all appearances identical with *H. fraterna.* To prove identity definitely it would be necessary to show that man can be infected with eggs of *Hymenolepis* from the rat or mouse. This has not yet been done.

In his experiments in England the author obtained a much larger proportion of successful results from feeding mice with eggs of *H. fraterna*, and the difference is ascribed to one or more of three factors : (1) Change of host ; eggs which have developed in the human subject for several generations may be adversely affected when first introduced into the mouse ; (2) The mice used were full-grown adults, whereas the worm develops much more readily in young animals ; (3) The mice were healthy and well fed in the Lisbon experiments whereas those in London were in poor condition. The sizes of the eggs from *H. nana* were found to be the same in small and large specimens of worms, and, as has been acknowledged by BAYLIS, who examined several of the author's specimens, no large gaps could be found in the ascending scale of total size ; *H. longior* can thus be no longer regarded as a valid species. It is almost certain from the work recorded in the present paper that *H. nana* and *H. fraterna* are identical, and, if so, the name " *H. fraterna* " also lapses. On feeding mice with eggs of *H. diminuta* no results were obtained, JOYEUX's work being confirmed in this respect.

H. H. S.

BAYLIS (H. A.). **The Range of Variation of** *Hymenolepis nana* **in Rats and Mice.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 415–418. [2 refs.]

From examination of a number of specimens obtained by Dr. WOODLAND from experimental feeding of mice with eggs of *Hymenolepis nana* and a consideration of his own previous work on this genus the author concludes that *H. longior* is not a valid species but that gradations are met with between the *H. nana* with mature segments appearing about 75 from the head and the "*H. longior*" maturing at about the 250th segment, and that, consequently, all the specimens, since they are morphologically similar though they vary widely in total length and in the number of segments, belong to a single species, *H. nana*.

H. H. S.

GRAYBILL (H. W.). **The Life-History of** *Hymenolepis nana* **v. Sieb.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 217–218. [2 refs.]

A brief paper adducing evidence of the direct development of *Hymenolepis nana* in the mouse, but neither so full nor so convincing as other papers already published on the same subject in this country.

H. H. S.

INDIAN JOURNAL OF MEDICAL RESEARCH. 1925. Jan. Vol. 12. No. 3. p. 579.—**Note on** *Hymenolepis nana*. [Communication received by the Editor from Colonel Clayton LANE.]

Attention is drawn to records of the occurrence of *Hymenolepis nana* in man in India, viz., LANE 1909, JONES 1910, REANY 1912, STEWART 1916, and others which precede the record which NANAVUTTY recently presumed to be the first for India.

R. T. L.

KAMADA (Ryonosuke). [**Hemolytic Substance found in the Body of** *Hymenolepis diminuta*. **On the Feature of Blood of the Albino Rat infested by this Parasite.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1924. July. Vol. 31. No. 4. [Summarized in *Japan Med. World*. 1924. Dec. 15. Vol. 4. No. 12. pp. 332–333.]

A haemolytic substance occurs in small amount in the body of *Hymenolepis diminuta*, and comprises an oil acid and a lipoid saline soluble substance. Albino rats affected with this parasite are anaemic, and the eosinophile cells in their blood are increased.

R. T. L.

DERVIS (Themistocles). *Taenia solium* **als Ursache einer Anaemia perniciosa.**—*Muench. Med. Woch.* 1924. July 11. Vol. 71. No. 28. p. 942. [1 ref.]

Anaemia perniciosa caused by *Taenia solium* is very seldom reported. This apparently justified the communication of the following case.

The patient (female) was for some months ailing with faintness, palpitation, loss of appetite, sometimes diarrhoea, and deafness. Leading symptoms: burning and vesicles on the tip of the tongue, itching of the nose. Objective signs: straw-coloured retina very pale, breath foetid; tongue reddened, especially on the tip, covered with vesicles and rhagades; tender. Over the pulmonalis, systolic murmurs, and also venous hums. Increased motility of the stomach, achylia gastrica. In the stool, *Taenia solium*. No occult bleeding. Spleen enlarged. Wassermann and Pirquet reaction negative. No plasmodia of malaria. Blood: haemoglobin 30 per cent., red blood corpuscles 900,000, white blood corpuscles 4,500, colour index 1·6. Leucocytes 34, lymphocytes 60, monocytes 2, eosinophilic cells 2, myelocytes 2 per cent., polychromatic erythrocytes, typical megaloblasts, megalo-, micro- and poikilocytosis. A slow but steady recovery followed the expulsion of the worm and treatment with arsacetin (0·2 gm.). Examination four years later proved absence of any complaint.

R. T. L.

DEW (Harold R.). **The Histogenesis of the Hydatid Parasite** (*Taenia echinococcus*) **in the Pig.**—*Med. Jl. Australia.* 1925. Jan. 31. 12th Year. Vol. 1. No. 5. pp. 101–110. With 15 text figs. [3 refs.]

This paper is full of interest, particularly if read in conjunction with the author's previous description of the development of brood-capsules and scolices [see this *Bulletin*, Vol. 21, p. 209.]

A very complete account is given of the earliest stages of development of the hydatid and of the tissue changes set up in the liver. The study is based on the experimental infection of a series of sucking-pigs, six weeks old, with ripe proglottides of *Taenia echinococcus.* The animals were killed at periods ranging from 8 hours to 5 months later, and the liver was removed and serial sections made. Parasites were found in the portal vein 8 hours after ingestion and in 12 hours they were in the liver. The first cellular reaction on the part of the host consists of mononuclear cells derived from the local connective tissue and the endothelial cells. In 28 hours these are reinforced by lymphocytes, the cells together forming a somewhat diffuse follicle with a few eosinophile cells at the periphery, and beyond that an engorgement of the capillaries with red cells and lymphocytes. By the third day the parasite is completely hidden by this cell-accumulation. In some cases the reaction on the part of the host may overcome the parasite at the end of the first week and bring about its fragmentation. If this does not occur the parasite increases in size and becomes definitely vesicular by the end of the second week. By the 21st day the follicle measures 0·25-0·35 mm. in diameter and is visible to the naked eye. Microscopically, the endothelial cells are arranged radially round the parasite, with many giant cells, apparently the result of fusion of endothelial cells. By this time the external membrane shows signs of lamination. The follicle itself now occupies the greater part of a complete lobule and encroaches on the periportal zone. In three months the diameter is 40–50 mm. and the laminated membrane well developed; in five months the size has again doubled. The bile-ducts act as points of resistance and thus seem to determine pouching of the growing cysts. The liver cells in contact with the adventitial layer undergo pressure atrophy and are replaced by fibrous tissue. This pouching leads to the production of multilocular cysts and at the same time adjacent cysts may fuse, but the complexity does not reach that described in *Echinococcus alveolaris.* Even as late as 5 months there is no trace of the formation of brood-capsules. In some, from the third to the fifth month, retrogressive changes may occur with thickening of the adventitia, destruction of the hyaline laminated membrane, and absorption of the fluid.

H. H. S.

BRYCE (Lucy M.), KELLAWAY (C. H.) & WILLIAMS (F. Eleanor).—**A Study of Hydatid Antigen.**—*Australian Jl. Experim. Biol. & Med. Sci.* 1924. Sept. 15. Vol. 1. Pt. 3. pp. 77–91. With 4 figs. [10 refs.]

In the opinion of the reviewer this paper would be more useful if the subject matter were dealt with in three or four separate contributions. In its present condition statements relating to complement fixation, precipitins, sensitization and antigens are closely interwoven, rendering it necessary to read paragraphs and sentences again and again in order to discover the meaning.

The authors discuss the peculiarity of hydatid fluid as antigen for the precipitin reaction in its becoming inactive after heating to 56° C., and ascribe this to the presence of precipitoid in the heated serum. Deterioration begins at 50° C., and it is not reactivated by addition of fresh complement. The destruction of precipitin, however, does not affect the complement-fixing power of the serum. Though hydatid fluid yields good precipitin reactions, alcoholic extracts of scolices, dried and re-suspended in saline, prove negative—the reverse of what is found to occur for the complement-fixation test. Series of experiments on hydatid anaphylaxis are next described, noting the action on the isolated uterus of a normal guineapig after sensitization with one or with two doses of hydatid fluid. Comparison is drawn between this and ergotoxin and histamine actions. As an anaphylactic antigen hydatid fluid proved far superior to alcoholic extracts of scolices. Regarding the different antigenic preparations the authors carried out tryptic digestion of fresh scolices and of scolices thoroughly extracted with alcohol. Though the latter were not anti-complementary they proved less serviceable for the complement-fixation reaction than ordinary, undigested, scolices extracts. The trypsin extracts of fresh scolices were more satisfactory and were prepared in the following manner:—

"1 cc. of fresh scolices, washed three times with normal saline, was placed in a sterile flask containing 40 cc. of ·4 per cent. of sodium bicarbonate and ·1 gm. of Merck's trypsin. Five drops of chloroform were added, and the flask was then incubated at 37° C. At the end of 2, 4, 6 and 8 hours 10 cc. samples were drawn off, placed in sterile test tubes, and at once heated to 60° C. After cooling, they were neutralized with hydrochloric acid and placed in the ice chest. Before use for complement fixation the chloroform was driven off by bubbling sterile air through the liquid. These solutions proved to be potent antigens, even in a dilution of 1 in 20, and showed no tendency to react with syphilitic sera, but were weakly anti-complementary, even in high dilutions."

Acetone extract of scolices did not give so good an antigen as alcoholic extracts for complement-fixation tests. Alkaline autolysates proved to be potent for the complement-fixation tests but valueless for reactions.

H. H. S.

BISBINI (Bartolomeo). **Einige Betrachtungen ueber die Immunitätserscheinungen und deren Dauer bei der Echinokokkose.** [The Immunity Reactions and their Duration in Echinococcosis.]—*Cent. f. Bakt.* I. Abt. Orig. 1925. Feb. 18. Vol. 94. No. 3/4. pp. 204–207.

Case of a patient, 41 years of age, suffering from hydatid of the liver. The degree of eosinophilia, Casoni's intradermal reaction and complement fixation were determined before and after operation. The eosinophilia is stated to have been 30 per cent. prior to operation [probably a misprint, since the author states that it remained practically unchanged, between 2 and 4 per cent]. The cutireaction was well marked both before and after. The degree of complement fixation, however, diminished rapidly after the cyst had been surgically dealt with.

H. H. S.

ARCÉ (José). **A propos de l'action des rayons X (radiothérapie profonde) sur les kystes hydatiques.** -*Bull. Acad. Méd.* 1924. Dec. 2. Year 88. 3rd Ser. Vol. 92. No. 40. pp. 1290–1295. With 2 figs.

The author, having tested the effects of X-rays (5 milli-ampères and tension of 200 volts at a focal distance of 40 cm.) for varying lengths of time on " hydatid sand " on a slide under a coverglass, found that the scolices were disintegrated in the preparation exposed to the rays for an hour. He, therefore, tried the same on seven cases a day or two before operation and, on examining the fluid, found in three of them that the scolices were motionless and in some instances disintegrated. He intends to pursue the question further.

H. H. S.

STENHOUSE (H. M.). **Renal Pathology in Filariasis bancrofti.**—*U.S. Nav. Med. Bull.* 1925. Jan. Vol. 22. No. 1. pp. 1–12. With 3 figs & 2 charts.

A large proportion of the inhabitants of St. Croix, W.I., is infected with *Filaria bancrofti.* In the Frederiksted district 20 per cent. of the patients admitted to hospital have the embryos in their peripheral blood. The disease is said to cause early damage to the kidneys which may persist after the death of the parent filariae. 93 out of 100 unselected cases showed albuminuria, and it is common for patients to get up two or three times at night to micturate. The author explains that " the presence of the parasites in the kidneys during the day in some way limits the physiologic function at that time. During the night when the embryos migrate to the periphery it is natural that a compensatory effort should be made to eliminate the accumulated products of katabolism."

The cases are divided into two groups. In the one, in which elephantiasis is absent, the renal tissue is soft and pasty-brown in appearance, tubular casts are seen and embryos may be found. In the other, with elephantiasis, there is gross fibrosis, the capsule is thickened, the parenchyma degenerated and large cysts are common.

H. H. S.

TANON (L.). **Traitement des filarioses vasculaires.**—*Presse Méd.* 1925. Feb. 28. Vol. 33. No. 17. p. 265.

Hectine given by a technique very similar to that used for the treatment of syphilis is recommended by the author for the treatment of filarial infection. The total dose used in a course of treatment is 2 gm. in slight cases, 3 gm. in serious cases. The number of cases treated so far has been few.

R. T. L.

LOW (George C.) & COOKE (W. Ernest). **Bayer "G. 1919" in the Treatment of Filariasis.**—*Lancet.* 1924. Nov. 1. pp. 903-904. [2 refs.]

Bayer "G. 1919," a new preparation manufactured by the same firm as "205," and recommended for the treatment of filariasis, was tried by the authors on a patient suffering from infection by *Filaria bancrofti.* In order to test its efficacy the embryos seen in a measured quantity of blood, 20 cmm., taken at the same hour each night, were counted from day to day. The drug was administered intravenously in doses of 0·5 gm. dissolved in 5 cc. distilled water once a week between 2 and 3 p.m. for 10 weeks. Before treatment was started the average number of embryos was 230. On the night of the first injection there was a marked fall to 136, but thereafter the fluctuations were considerable, varying between 75 and 200. There was no steady diminution as would be expected from a direct action of the drug on the adult Filariae.

The preparation was reputed to cause nephritis and dermatitis, but, though there was a little albuminuria, no casts appeared and there was no sign of dermatitis throughout the course of treatment. The authors concluded that, judging from this single case, "the drug has failed to justify the claim of its producers that it has a beneficial effect in cases of filariasis."

H. H. S.

ROSE (F. G.). **"Bayer 205" in Filariasis.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 257–270. [12 refs.] [United Fruit Company, Boston, Mass.]

In controls the numbers of microfilariae in the circulating blood periodically wax and wane, but the numbers never decline in so pronounced a manner in untreated controls as during, and for some time after, the administration of "Bayer 205." Moreover, this temporary fall is preceded by a very marked rise in all cases. *In vitro,* using oxalated blood, no evidence could be obtained that "Bayer 205" exerted any toxic effect on the embryos. Nor was any *in vitro* effect produced in Bayerised blood, and it is assumed therefore by the author that the drop in the number of embryos after the administration of this drug is due to its effect upon the adult worms.

R. T. L.

JEANSELME (E.) & BLOCH (Marcel). **Adéno-lymphocèle filarienne.**—*Bull. Soc. Française Dermat. et de Syph.* 1924. July. No. 7. pp. 374–375.

An account of a boy of 14 who had lived until he was 11 in Guiana, then for 4 months in Guadeloupe, and then in Paris. There was a swelling just below the left groin the size of an orange, somewhat nodular. The inguinal glands were enlarged. There was no oedema or thickening of the skin, but the blood showed an eosinophilia of 20 per cent. Puncture of the swelling revealed embryos of *F. bancrofti.* The patient had been sent from the surgical side with a view to diagnosis and suggestions for treatment. Intravenous injection of tartar emetic was advised.

H. H. S.

SAITO (Genji). **[On Nodules in the Hernia Sac formed by the Adult Worm of Filaria.]**—*Hokuetsu Igakkwai Zasshi* (*Jl. of Hokuetsu Med. Soc.*). 1924. Apr. Vol. 39. No. 1. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 266.]

An inguinal hernia was surgically treated in a case of chyluria, without other filarial symptoms. During the operation a nodule was found in the sac and on microscopical examination proved to contain adult filaria worms.

R. T. L.

DUPUY. **Note préliminaire sur l'onchocercose.**—*Bull. Méd du Katanga.* 1924. Dec. Vol. 1. No. 6. pp. 258–260.

An examination of natives at Bukama, where numerous caravan routes converge, showed that onchocerciasis was especially prevalent in those coming from the district of Kabinda. The author has recognized in infected persons the presence of cysts, of lymphatic enlargements, filarial itch and localized epidermal lichenization which is reported by others to be associated with this infection. Anti-scabic treatment does not afford any relief to this type of itch.

R. T. L.

FÜLLEBORN (Friedrich). **The "Blinding Filaria" of Guatemala** (*Onchocerca caecutiens,* **Brumpt 1919).**—*Proc. Internat. Conference on Health Problems in Trop. America.* pp. 241–255. [19 refs.] [United Fruit Company, Boston, Mass.]

The *Onchocerca caecutiens* of Guatemala is morphologically indistinguishable from *O. volvulus* of Africa. In Africa, however, it is seldom associated with eye diseases, while various authors have associated it with dermatitis. The location on the scalp only is infrequent in Africa but common in Guatemala. Fülleborn and ZSCHUKKE found the Onchocerca in 70 per cent. of the labourers on one of the plantations in Guatemala, but only in two was there appreciable diminution of vision on objective examination. They formed the opinion that the Onchocerca carriers seen by them were perfectly healthy individuals and they deprecate the proposed *prophylactic* removal of the nodules. Injection of cocaine and other preparations into the parasitic cysts might be tried. The larvae of *O. caecutiens* occur in large numbers in the skin as in the case of *O. volvulus.* The microfilariae are indistinguishable.

R. T. L.

i. FAIRLEY (N. Hamilton) & LISTON (W. Glen). **Studies in Dracontiasis.** Part III.* **A Note on Various Local Indian Remedies.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 347–350. With 1 plate. [2 refs.]

ii. ——. Part IV. **The Clinical Picture. An Analysis of 140 Cases.**—*Ibid.* pp. 351–367. [35 refs.]

iii. ——. Part V. **Observations and Reflections on Intravenous Medication with Special Reference to Tartar Emetic.**—*Ibid.* pp.. 369–374. [10 refs.]

iv. ——. **Studies in Dracontiasis.** Part VI. *Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 429–438. With 11 text figs. [26 refs.]

i. Native remedies are numerous, but without beneficial results. The drugs given include santonin, white copaiba, asafoetida, ammonium chloride, the root of white oleander and rock salt. Special dietaries are also advocated by the vaidya. Local applications are universally employed, especially extract of aloes and poultices of onion, cactus, neem and betel leaves. The old Sanskrit remedy of poulticing day and night with the young sprouts of the Baman tree mixed with gur and linseed meal has recently been advocated by CHITALE (1912). Various methods of mechanical extraction are described in the paper, which is accompanied by an interesting plate illustrating curious instruments used by vaidya in operating on guineaworm.

ii. The incubation period ranged from 10 to 14 months. The maximum incidence of clinical dracontiasis in the Madras Presidency occurred in the months of March, April, May and June. Figures are given showing the frequency of recurrent dracontiasis in endemic areas. The average number of worms per individual was 1·9. Multiple infestations are frequent during the seasonal attack. Individual resistance is a real factor determining disease incidence, exposure not necessarily being followed by infection. The most characteristic clinical sign of the early systemic manifestations is urticaria. The cutaneous lesions were sometimes associated with gastro-intestinal disturbances and occasionally with severe dyspnoea, giddiness and syncopal attacks. Practically all the complications, except calcification, are dependent on secondary infection. The blood picture varies with the presence or absence of sepsis and intestinal helminthiasis.

iii. The majority of cases of guineaworm do not present themselves for clinical examination until the blister has ruptured. This occurred in 71·1 per cent. of the writers' series of 218 cases. In 43·7 per cent. septic complications were already established. In the latter group of cases mechanical extraction is necessary. In the minority specific therapy would be of real value if given prior to the rupture of the blister, but tartar emetic has proved neither to be lethal to the female or its embryos nor *per se* to modify the clinical course of the disease and its use has been entirely abandoned.

iv. The mode of surgical and mechanical extraction varies according to the stage of evolution of the case and the presence of complications. Rupture of the worm is liable to be followed by urticaria, vomiting, etc., but after the formation of the blister this need not be feared. The blister should be aspirated to limit the subsequent ulcer. When the worm is closely convoluted excision *en masse* is advised. Intermittent traction with massage is advocated in other cases. A new operative technique is described. Injection locally of antiseptics is not to be encouraged as the danger of adding chemical inflammation of the tissue more than outweighs the advantages. Injection of 1 in 1,000 sol. of adrenalin hydrochloride immediately relieves the prodromal urticaria, erythema and asthmatic manifestations.

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* For Parts I and II see this *Bulletin*, Vol. 21, pp. 567 and 956.

R. T. L.

PELTIER (M.) & DOMINIQUE (H.). **Note sur l'action du mélange émétique-extrait d'organes dans le traitement de la draconculose.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 846–850.

Dracontiasis is prevalent in Togo, many patients having multiple infection. Treatment by tartar emetic intravenously gave good results, but cure was slow and patients in many cases ceased to come up for injection. A mixture of organ extract and tartar emetic was, therefore, made in the following way : Not having rabbits at disposal the author took the liver of a sheep ; one volume of the pulp was mixed with two vols. of normal saline and centrifuged. The product was next placed at 37° C. for 5-6 hours and then for 20 hours on ice. The yellowish supernatant fluid was filtered. For use, equal parts of this and 1 per cent. antimony tartrate in normal saline were injected intravenously (intramuscular injection gave rise to intense pain), starting with 1 cc. Four to five hours later there was rise of temperature with shivering and, perhaps, vomiting, but these symptoms never appeared to be dangerous. Injections were made every 4 days, increasing by 1 cc. each time up to a maximum of 5 cc. Five cases are recorded ; from one patient 11 worms were extracted. They began to come out the day following the first injection.

H. H. S.

DELAMARE & DJÉMIL (Said). **Filaires de Médine calcifiées.** [Société Anatomique. 1923. June 30.]—*Études & Notes. Chaire de Médecine exotique de la Faculté de Constantinople.* p. 106.

This is a brief account of a girl, 10 years of age, showing in the legs fifteen scars due to removal of *Dracunculus medinensis*, and by X-rays several calcified fragments of other specimens in the tissues.

H. H. S.

DELAMARE (G.) & ACHITOUV. **Filaire de Médine calcifiée ; cellules géantes de corps étrangers, infiltration embryonnaire et sclérose.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 788–790.

The histological details of a section of tissue showing "helminthic pseudotuberculoma" are described. The condition was due to irritation set up by a dead *Dracunculus medinensis* with formation of giant cells.

H. H. S.

STILES (C. W.) & BROWN (Gertrude). **The Present Status of the Parasitic Nematode Family** *Ascaridae.*—*Public Health Rep.* 1924. Aug. 8. Vol. 39. No. 32. pp. 1957–1962.

The nematode genus *Ascaris* Linnaeus 1758 contained so many and varied species that these have gradually been sorted into three superfamilies, several families and numerous genera. In the present paper the authors have brought together the subfamilies and genera of the family Ascaridae, at present defined as parasitic nematodes with three lips. The various forms are defined and arranged in a characteristically American " watch your step " tabulation.

R. T. L.

GOLDSCHMIDT (Eduard). **Beiträge zur Diagnose und Therapie der Askaridiasis.**—*Muench. Med. Woch.* 1925. Jan. 9. Vol. 72. No. 2. pp. 52–54. With 1 text fig. [13 refs.]

The author first points out the difficulties which may arise in the diagnosis of Ascaris infection in patients whose faeces contain atypical forms of ova. These forms are, in his opinion, the result of absence of fertilization and the greater susceptibility of such ova to the action of the digestive juices.

The various drugs employed in treatment are divided into four groups: (1) The aromatic series of derivatives, such as naphthalin, santonin, vialongaperlen (santonin plus tanacetin), thymol, etc.; (2) The chenopodium group including, besides the oil itself, oxural, wermolin and chenoposan; (3) Aluminium preparations, of which Oxymors is an example; (4) Helminal. The action of the members of the first two groups is, in small doses, to stimulate the parasites; in larger doses to narcotize them; in still greater doses to kill. The therapeutic doses are those which produce the second stage (narcosis of the parasite); beyond these there is danger of toxic action to the patient.

The author prefers to give chenopodium in the " gelodurat capsules " of Pohl, so that they may pass intact through the stomach and exert their action in the intestine. He gives it thrice daily at short intervals, namely, at 8 and 10 a.m., and 12 noon, followed by a purge two hours later. These capsules are prepared in two strengths; one for children containing 6 drops of the oil, the other for adults containing 16 drops.

H. H. S.

NISHIGORI (Masawo) & OHBA (Tatsunosuke). **[On the Route of Migration in the Host's Body taken by the Ascaris.]**—*Nissin Igaku (Progress in Med.).* 1924. June. Vol. 13. No. 8. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 263.]

From a study of serial sections of experimentally-infected animals, the author concludes that the main route of migration of ascaris larvae is by the blood and lymph capillaries of the intestinal wall, thence *via* the portal vein, or through the lymph stream into the thoracic duct, and thus to the right ventricle and the lungs. Some of those entering the lymph could also reach the portal vein *via* the lymphatic ducts and reach the lungs. Exceptionally some might pierce the gut wall and get into the abdominal cavity, but still find their way into the liver stroma and thence into the lungs.

R. T. L.

SUYEMORI (S.). **On Pathological Changes in the Eye during the Incipient Stage of Infection with Ascaris. (Experimental Study.)**—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. of Formosa).* 1925. Feb. No. 239. English summary p. 1. [In Japanese.]

Embryonated ascaris eggs from pigs were administered, by the mouth, to guineapigs and a monkey. Among the ensuing symptoms aud pathological changes were anisocoria and retinal haemorrhages. Those larvae which had been carried by the blood stream to the eye were seen in the uveal tract, retina, optic nerve, etc.; they were especially abundant in the Harderian gland (in the guineapig), and in the choroid. Some larvae had produced organic changes in the surrounding tissues, chiefly comprising round cell infiltration, mainly of eosinophile cells and of polynuclear leucocytes and giant cells. Especially in the choroid were haemorrhages and worm nodules. No larvae occurred either in the lens or cornea. In the guineapig the ascaris larvae could be seen in abundance moving with the blood in the ocular organs 30 hours after infection. The majority doubtless passed on with the blood stream or lymph, but some remained and died in these organs.

R. T. L.

RANSOM (B. H.), HARRISON (W. T.) & COUCH (J. F.). **Ascaris Sensitization.**—*Jl. Agric. Res.* Washington. 1924. May 10. Vol. 28. No. 6. pp. 577–582. With 1 plate. [8 refs.]

Susceptibility to the toxins of Ascaris appears to be fairly common; the symptoms are similar to those of protein sensitization and they have been ascribed to volatile emanations from the worm. The authors tested the cutaneous reaction of certain sensitive persons to various extracts obtained from Ascaris, some containing globulin, some albumin, others being protein-free. They showed that the substance in the aqueous extracts which causes this reaction in sensitive individuals is absent from the globulin fraction, but present in the albumin fraction and also in the protein-free filtrate after removal of both these by precipitation with ammonium sulphate. Further, it is not volatile between 20° and 100° C.; it survives the latter temperature for 15 minutes, but is destroyed by less than an hour's exposure.

H. H. S.

SEISHIN (Ryu.). **On the Treatment of Ascariasis with Santonin Suppositories.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1924. Sept. No. 236. English summary p. 7. [In Japanese.]

Santonin suppositories used alone are 10 per cent. more effective than a mixture of calomel and santonin used internally, even though in the former case the quantity of santonin used is about one-third of the doses given in the latter cases. When the santonin suppository is inserted and calomel is used internally in addition, 90 per cent. of the patients are cured. This suppository should, therefore, be given whenever there is any difficulty in administering santonin internally. Within 30 minutes of inserting a santonin suppository a santonin reaction can be obtained in the patient's urine.

R. T. L.

PAYNE (Florence K.), ACKERT (James E.) & HARTMAN (Ernest). **The Question of the Human and Pig** *Ascaris*.—*Amer. Jl. Hyg.* 1925. Jan. Vol. 5. No. 1. pp. 90–101. [13 refs.]

The identity or otherwise of the Ascaris of man and the pig gravely affects control of ascariasis in the tropics. The authors have attempted a solution: (1) By feeding embryonated eggs of human ascaris to pigs, and of pig ascaris to primates; (2) by studies on the incidence of human and pig ascaris in Trinidad. Five young pigs were repeatedly fed with infective ascaris eggs of human origin. All suffered respiratory disturbances and other systemic disorders but no adult worms were found subsequently in the gut at post-mortem. The administration of ascaris eggs of human origin gave rise to severe "thumps" in the pigs. Infective ascaris eggs from the pig were swallowed by one monkey and by two human subjects. The faeces failed to give positive results throughout a subsequent period of several months. The incidence of ascaris in man in Trinidad varied from 20 per cent. to 70 per cent., and in the pig from 3·5 per cent. to 10·8 per cent. In the vicinity of Arouca, one of the principal swine-raising regions, the incidence of ascaris in the pig was 10·8 per cent. and in man 64·3 per cent. The authors conclude that their experimental studies show a definite physiological difference between the ascaris of the pig and that of man.

R. T. L.

HARTMANN-KEPPEL (G. L.). **L'ascaridiase du foie et des voies biliares.**—*Jl. de Chir.* 1923. Vol. 21. pp. 157–169. [16 refs.]

Two cases of infection by *Ascaris lumbricoides* in which the liver was involved are recorded in detail. The first, a soldier aged 34 years, suffered from attacks of fever lasting 3 to 7 days with pain in the right hypochondrium and right shoulder. The faeces contained ova of ascaris and also adult ascaris and oxyuris. During the three weeks prior to admission there had developed a swelling below the right costal margin in front, with exacerbation of the fever and pain. At operation an abscess of the *left* lobe of the liver was found and two female ascarides, 19 and 24 cm. in length, apparently dead. The second patient was a girl of 12 years with very similar symptoms, and from an abscess, likewise in the left lobe, a dead female ascaris, 23 cm. long, was removed.

The remainder of the paper deals with the pathological anatomy, symptoms, diagnosis and treatment. The author states that the liver and biliary tract may be affected in different stages of development of the worm. Firstly, where the pulmonary circuit is cut out altogether, the immature larvae may set up hepatitis, either circumscribed or acute and diffuse ; secondly, where the stay in the lungs is interrupted, the larvae may become adult in the liver, setting up single or multiple abscesses, or, in the bile ducts, angiocholitis with or without obstruction ; thirdly, the worms may migrate when small via the bile ducts and give rise to abscesses.

H. H. S.

LEVIN (Joseph J.) & PORTER (Annie). **Surgical and Parasitological Notes on Four Cases of Intestinal Obstruction due to Accumulation of very Large Numbers of Round Worms.**—*Brit. Jl. Surgery.* 1924. Vol. 11. No. 43. pp. 432–438. With 3 text figs.

Four cases are recorded, three European girls, aged 8, 9 and 10 years respectively, all from the same orphanage, and one Hottentot boy, aged 11 years.

The boy had signs of intestinal obstruction, and at operation 851 worms were removed from incisions into the jejunum ; 48 more were passed subsequently. The patient made an excellent recovery. The others were provisionally diagnosed as cases of acute appendicitis, but operation was undertaken for the obstruction. In one, "several hundreds of worms were removed," and a few more came away later ; this patient died. From the second, 737 were removed at operation and another 253 were passed subsequently, 990 in all, and the patient recovered. The third was found to have already a perforation of the bowel which was also gangrenous. 268 were removed, in addition to "hundreds thrown away" inadvertently before they were counted. Death took place the same night. In all four the jejunum was the part involved. The average length of the worms was, in one case, 3½ in., in another 5½; in a third the males were 5 in., and the females 6¾ in.

H. H. S.

ALLES (E. C.). **Acute Intestinal Obstruction caused by Dense Accumulation of Round Worms.**—*Jl. Ceylon Branch of the Brit. Med. Assoc.* 1924. Sept. Vol. 21. No. 2. pp. 123–124.

The case of a woman, 24 years of age, admitted to hospital for symptoms of acute intestinal obstruction. At operation there was noticed to be a peritonitis, and two worms [presumably Ascaris] were found to have penetrated the gut-wall. The small intestine was packed densely in parts with round worms; 547 were removed by incision into the bowel and nearly as many more were left. Death occurred the following day from peritonitis.

H. H. S.

GENTILUCCI (Giuseppe). **Occlusione intestinale per una rare anomalia congenita del colon trasverso—Raro incidente da ascaridi durante la narcosi.** [Intestinal Occlusion due to a Rare Congenital Anomaly of the Transverse Colon. A Rare Incident caused by Ascarides during the Narcosis.]—*Policlinico.* Sez. Prat. 1924. June 30. Vol. 31. No. 26. pp. 839–841. [5 refs.]

During an operation for intestinal obstruction, the patient, a boy of 16, while under deep narcosis, became suddenly cyanotic, presenting signs of occlusion of the air-passage, and retching strongly. On opening the mouth a mass of ascarides was seen blocking the trachea and pharynx, while some of them wriggled out of the nose. Thereupon the head of the patient was turned face down, the ascarides were extracted, artificial breathing and inhalation of oxygen applied, and the patient recovered. This incident seems to have been due to washing out of the stomach before the operation, as well as to the manoeuvring of the operator in the abdomen setting up antiperistaltic movements of the bowels and the effect of the ether upon the worms, which became excited and took refuge in the upper part of the intestinal canal as the lower part was blocked. The author urges an anthelmintic treatment of patients coming from places the population of which is known as worm infested before submitting them to any operative measure.

R. T. L.

DICKINSON (R. F.). **A Case of Human Infestation with** *Belascaris mystax*.—*Jl. Roy. Army Med. Corps.* 1925. Feb. Vol. 44. No. 2. p. 111.

In Mauritius, a girl, 3 years old, daughter of British parents of good social position, passed a worm in a copious putty-coloured stool. The faeces contained the fine honeycomb marked eggs of *Belascaris mystax*, and the adult was identified, after serial sectioning, by Dr. Clark H. YEAGER, of the International Health Board staff.

R. T. L.

i. GOHEEN (R. H. H.). *Ascaris lumbricoides.*—*Jl. Assoc. Med. Women in India.* 1925. Feb. Vol. 13. No. 1. pp. 11–16.

ii. LE ROY DES BARRES (A.). **L'ascaridiose hépatique.**—*Rev. Méd. et Hyg. Trop.* 1924. Aug.-Dec. Vol. 16. No. 6. pp. 161–167.

iii. SAWADA (Taku) & OHKI (Tsunematsu). **[On the Influence of Radium Emanation against the Eggs of the** *Ascaris lumbricoides.*]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1924. Sept. Vol. 31. No. 5. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 45.]

iv. KOBAYASHI (Muneharu). [**Experimental Elimination of Ascaris by the Use of a New Anthelmintic " Soveran."**]—*Chugwai Iji-Shimpo* (*Internat. Med. Jl.*). 1924. Sept. Vol. 43. No. 18. [Summarized in *Japan Med World.* 1924. Dec. 15. Vol. 4. No. 12. p. 329.]

i. The author finds that in certain parts of India the incidence-rate of *Ascaris lumbricoides* is 90 per cent. and over. Two cases had febrile symptoms, one of which was regarded for a time as enteric ; both cleared up after a vermifuge had expelled the worms.

ii. A general account of the surgical conditions of the liver arising from the presence of Ascaris in that organ, culled from various records.

iii. Radium emanations in small doses have little influence on the development of Ascaris eggs ; if any, the rate is accelerated. In large doses many of the eggs are destroyed.

iv. The author reports satisfactory results from the clinical use of " Soveran " in cases of ascaris infection, but the summary gives no indication of the chemical composition of " Soveran."

R. T. L.

JAPHA (Arnold). **Die Verbreitung von** *Oxyuris vermicularis* **bei Schulkindern.**—*Muench. Med. Woch.* 1925. Mar. 20. Vol. 72. No. 12. pp. 473–474. With 1 text fig. [14 refs.]

The author examined 202 school children in 1922 and found 66 per cent. of them infested with Oxyuris, and again among 300 other children between the ages of 6 and 14 years 73 per cent. This is considerably more than was given in pre-war records, and the high rate is ascribed to the general uncleanliness from scarcity of soap at the end of the war and to overcrowding.

H. H. S.

PHILPOT (F.). **Notes on the Eggs and Early Development of Some Species of Oxyuridae.**—*Jl. Helminthology.* 1924. Sept.-Nov. Vol. 2. Nos. 4 & 5. pp. 239–252. With 4 text figs.

Oxyuris vermicularis lays its eggs as soon as the worm comes into contact with air. The eggs show a peculiar and characteristic " emergence " area. Aeration is a very important factor in the successful development of the ova in water. Embryos emerge spontaneously from the egg shells by piercing the emergence area after about 70 hours in tapwater at 22° C. Whereas " tadpole " embryos were disintegrated by digestive juices, coiled embryos of older cultures hatched and were extremely active in the same media. No success followed attempts to demonstrate skin penetration, nor could rats or mice be experimentally infected with *O. vermicularis.* Studies on various other species of Oxyuridae, including the life histories of *Syphacia obvelata* and *Oxyuris tetraptera* of mice, are included in the paper.

R. T. L.

KEHL (Renato). **O tratamento da oxyurose.**—*Brazil-Medico.* 1924. Aug. 16. Year 38. Vol. 2. No. 7. pp. 114–115.

The author has cured several cases of oxyuriasis with Butolan. For adults he prescribes three tablets of 0·50 gm. each daily up to a total dose of 20 tablets, followed by a purgative. The doses for children are according to age, an average of a half tablet for those under 10 years, and one-quarter for those under 2. The good results were confirmed by Dr. TRAVASSOS of the Oswaldo Cruz Institute.

R. T. L.

LORENTZ (Friedr. H.). **Eine einfache Oxyurenbehandlung.** [A Simple Treatment for Oxyuris.]—*Med. Klin.* 1925. Jan. 18. Vol. 21. No. 3. pp. 95–96.

The author discusses the value of WEINBERGER'S "Simple and Reliable Treatment of Oxyuris Infection" by rectal injection of Chloramin which BRÜNING had objected to as neither simple nor reliable [this *Bulletin*, Vol. 21, p. 962].

He states that the eggs of Oxyuris develop only within the anal ring, in the dried or drying faeces there, and that the irritation set up is due to the emergence of the developing larvae. Moisture is, therefore, inimical to them, and the value of the treatment depends largely upon the water injected, and he recommends that after each action of the bowels a thorough washing of the rectum should be carried out. By this means he finds that in from 8 to 14 days the worms disappear permanently.

H. H. S.

GEINITZ (Rudolf). **Eine einfache Oxyurenbehandlung.**—*Med. Klin.* 1925. Apr. 3. Vol. 21. No. 14 (1060). pp. 507–508. [1 ref.]

The author inveighs at some length against LORENTZ'S "simple and successful method" of treating Oxyuris infection by rectal injections of water, and states that he has found the eating of raw carrots, either plain or mashed, gives excellent results. The chemical action of this food is outside his province, but, he suggests, might be profitably investigated. He sums up its use as harmless, handy, cheap and reliable.

H. H. S.

LUZZATTI (Tullio). **Un efficace metodo di trattamento contro l'ossiuriasi.**—*Pediatria.* 1924. Aug. 15. Vol. 32. No. 16. pp. 965–966.

——. **Sul trattamento cloroformico dell' ossiuriasi.**—*Ibid.* 1925. Mar. 15. Vol. 33. No. 6. p. 319.

The mixture of chloroform and castor oil recommended by G. ALESDRINI for the treatment of hookworm and taenia has proved very efficacious in the cure of oxyuriasis. Pure anaesthetic chloroform should be used in dose of gm. 2 in a quantity of castor oil. The optimum amount varies with age. Three doses at intervals of a fortnight should eradicate the infection.

R. T. L.

VERNE (J.). **Etude histologique d'un cas d'appendicite à oxyures.**—*Ann. Parasit. Humaine et Comparée.* 1925. Jan. Vol. 3. No. 1. pp. 60–67. With 4 text figs. [7 refs.]

A boy of 10 years who had symptoms suggestive of petit mal and pain over McBurney's point had his appendix removed. Its lumen was found to be constricted in three situations and in nodosities were seen aggregations of 3 or 4 specimens of Oxyuris, all females. The mucous membrane was excoriated and the lumen contained altered blood in which the parasites were living. At the sites occupied by the worms the epithelial cells were ciliated, a condition attributed to mechanical irritation from their presence. In the submucosa there was congestion associated with a local eosinophilia and accumulation of plasma cells.

H. H. S.

HARRIS (William H.) & BROWNE (Donovan C.). *Oxyuris vermicularis* **as a Causative Factor in Appendicitis.**—*Jl. Amer. Med. Assoc.* 1925. Feb. 28. Vol. 84. No. 9. pp. 650–654. With 3 text figs. [13 refs.]

In an uninterrupted sequence of 121 cases of operative appendicitis *Oxyuris vermicularis* infestation occurred in 22 appendixes. The results of gross and histologic studies show conclusively that these worms play a definite pathogenic rôle in the causation of the lesions in the appendix. It is important to consider the likelihood of *O. vermicularis* infection in all cases of chronic recurrent appendicitis. The authors believe that insufficient attention has been given to the parasite by clinicians, surgeons and pathologists. Three instructive microphotos illustrate the text.

R. T. L.

MARZIANI (Luigi). **Calcolo appendicolare di natura parassitaria.**—*Policlinico.* Sez. Prat. 1924. Apr. 21. Vol. 31. No. 16. pp. 514–515. [5 refs.]

The patient, female, aged 40, was operated on in consequence of appendicitis gangrenosa perforativa with diffused purulent peritonitis. There was found in the appendix at the site of perforation a hazelnut-sized coprolith of hard consistence. Microscopical examination proved that the centre of the calculus consisted of an immense number of eggs of Trichocephalus, forming a conglomerate. In the appendix itself no mature parasites were found.

Apparently in this case the appendicitis was not caused by the parasites, but by their eggs which, forming the nucleus of the coprolith, produced inflammation. The calculus was therefore of intestinal origin and had grown within the appendix until, by superposition of salts and food detritus, it blocked the lumen and caused perforation.

R. T. L.

GRUBER (Gg. B.) & v. HABERER (H.). *Trichocephalus trichiurus* **als lebensgefährlicher Parasit.** [*T. trichiurus* as a Dangerous Parasite.]—*Wien. Med. Woch.* 1924. Sept. 20. Vol. 74. No. 39. pp. 2015–2022. [12 refs.]

Two cases are here recorded. The first was in a man of 48 years who had suffered from dysentery in 1916. Subsequently, he complained of colic and diarrhoea and was anaemic, and an ileocaecal swelling appeared. This was removed by resection in 1919, and when the specimen was examined at the Mainz Pathological Institute the caecum showed inflammatory changes in the mucosa, submucosa and muscularis with venous thrombosis and local eosinophilia, and twelve specimens of *Trichuris trichiura* were found. The condition is ascribed definitely to the helminthic and not to the dysenteric affection.

The second patient was a man of 38 years with symptoms of a mild chronic obstruction and a swelling in the right iliac region. Under the belief that this mass, which was as large as a man's head, was tuberculous in nature, laparotomy was performed, and a tumour involving the last three feet of the small intestine and adjacent part of the caecum was removed. On examination the lymph glands in it were found to be enlarged, but without any signs of tuberculosis ; the mucosa of the caecum was congested, bluish-red, oedematous and wart-like from irregular swellings with small patches of ulceration. Fifteen specimens of Trichuris were removed from the mucosa.

H. H. S.

NITZULESCU (Virgil). **Ueber das häufige Vorkommen des** ***Trichocephalus trichiurus*** **in Rumänien.** [Frequent Occurrence of *T.t.* in Rumania.]—*Cent. f. Bakt.* 1 Abt. Orig. 1924. Oct. 15. Vol. 92. No. 7/8. pp. 542–546. [13 refs.]

Statements suggesting that infection by *Trichuris* is rare in Rumania are, according to the author, due to want of examination, for, on examining 30 patients suffering from various chronic complaints, he found this parasite in 26 of them, namely, in 10 of 11 women, and in 16 of 19 males.

H. H. S.

VAN THIEL (P. H.). **Onderzoek omtrent het dooden van spiertrichinellen door koude.** [The Effect of Cold on Trichina in Muscle.]—*Tijdschr. v. Vergelijk. Geneesk. enz.* Leyden. 1924. Dec. 30. Vol. 11. No. 1. pp. 48–65. [9 refs.] English summary pp. 66–67.

In experiments carried out by the author a refrigeration for four hours was necessary to destroy the infective power of trichina larvae encysted in small pieces of flesh of the guineapig. When, however, the pieces of flesh were cut into smaller pieces death followed after five minutes exposure at —20° C. This shows that the dimension of the infected meat is a factor which must never be overlooked. Moreover, the larvae vary in their resistance to cold, but this is not due to difference in age. A useful technique for the determination of the presence of adult trichina in the intestine is to shake the contents with antiformin and centrifuge.

R. T. L.

GUGGIARI (P. Bruno) & CROVATO (Gustavo). *Oxyuris incognita* **o** *Heterodera radicicola ?—Rev. Soc. Cientifica d. Paraguay.* **1924.** Oct. Vol. 1. No. 6. pp. 83–84.

The faeces of a child, age 7, showed numerous ova of " *Oxyuris incognita,*" or *Heterodera radicicola.* The eggs alone are found in faeces and usually occur in the summer. Variations are due to the different culinary manipulations to which vegetables are submitted before consumption. The ova disappeared from the stool without treatment.

R. T. L.

LANE (Clayton). **The Mass Diagnosis of Ankylostome Infestation. (Parts VIII to XIII.)**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 278–310. With 13 figs. [8 refs.]

Continuing previous studies [this *Bulletin*, Vol. 20, p. 947; Vol. 21, p. 574], and particularly the unsuccessful efforts to enrich the preparation and to contract the examination area obtained by direct centrifugal flotation (D.C.F.), a long series of counts shows the former aim to be attainable by the simple expedient of lifting off rapidly, instead of as hitherto slowly and carefully, the cover under which ova are collected as a hanging preparation in this technique. The apparent triviality of the change is negatived by the finding that the maximum, average and minimum percentages of the presumed total ovum content recovered after rapid lift were 95, 85 and 61, and after slow lift 84, 62 and 40, so that in this series the average recovery of ova was by rapid lift increased 30 per cent., and equalled the maximum by slow lift. It was found, moreover, that rapid lift tends to herd the ova towards the centre of the preparation, that by definite movements of the slide this herding can be markedly increased, and that by others the herd can be dispersed, should the ova in it (for the herding movements tend to concentrate all matter in the preparation) be obscured by overcrowding. The herd forms a visible cloud, capable of being placed directly under the objective, consisting in favourable conditions of almost nothing but hookworm ova, and constituting in practice a marked contraction of the examination area. These statements are evidenced by charts showing the number of ova present in every square microscope field throughout the whole of a number of preparations, and by photomicrographs. It is felt that the phenomenon is likely to prove of essential significance in hastening, and therefore cheapening, a positive and, so it would also seem, a negative diagnosis.

It is next shown that preliminary centrifugal precipitation in a salt solution of s.g. 1050 (as advocated by BASS in 1909 to eliminate matter lighter than hookworm eggs but heavier than water) was likely to be followed by reduction of the efficiency of a subsequent centrifugal flotation; and that the use of a salt solution of s.g. 1150 instead of 1200 reduced, in the cases tested, the number of ascaris and trichuris ova by ten-elevenths, and had a corresponding, but not necessarily parallel, effect in eliminating from the examination area matter other than ankylostome eggs, without reducing the average numbers of these collected. Diagnosis of ankylostomiasis is thus rendered rapider and easier.

There are stressed difficulties, generally unappreciated, in determining the ovum content of the faeces, and the worm content of the bowel, which render illusory certain estimates of the faecal ovum content produced by a single normally ovipositing female, knowledge of which should form the essential basis of every diagnostic technique. The evidence collected indicates that this last content lies between 10 and 500 per ccm. for hookworms, and that examination by D.C.F. of a fair sample of stool amounting to 1 cc. accordingly suffices to detect ova if a single female hookworm be normally ovipositing.

In the absence of any attempt by others to do so, the concentrative techniques of SHEATHER, MHASKHAR and WILLIS are checked against D.C.F. by comparative ovum counts. WILLIS's technique, so commonly used, but hitherto always apparently without control, is, for instance, shown to deliver a markedly uncertain percentage of the ova which D.C.F. pushed to finality shows to be present, and is accordingly not advised where better can be used.

In Part XII the writer returns to his consistently expressed conviction that mass hookworm diagnosis cannot be adequate, financially or otherwise, until the material is examined, as all other like material is, at a central laboratory which should possess diagnostic and research sides. In view of the evidence collected that D.C.F. is the most certain known diagnostic method, the best means of bringing stools to a central laboratory in a condition suitable for this technique were next investigated. Provided faeces were kept under plain water at a temperature not over 28° to 30° C., D.C.F. remained fully effective, in the cases tested, for 35 to 81 days. It is pointed out that if those conditions be observed faeces collected in India could accurately be examined and reported upon in London, a point indicative of the value of the stubbornly maintained necessity for making these examinations in the field. There are exhibited microphotographs of ova, apparently normal, which had lain under water for 92 and 102 days respectively, and which had been collected by D.C.F. Accordingly, discarding mere simplicity and aiming for diagnostic certainty and rapidity (a practical synonym of cheapness), a scheme is outlined for the collecting, centrifuging and herding of preparations, based on a unit of 12 stools and corresponding to the use of a twelve-tube centrifuge adapted for the carrying out of D.C.F.

A summary of the work completed in the twelve preceding parts concludes the paper.

C. L.

MHASKAR (K. S.). **Report of the Ankylostomiasis Inquiry in Madras.**—*Indian Med. Res. Memoirs Supplementary Series to Indian Jl. Med. Res.* 1924. Oct. Volume No. 1. pp. 1–95. With 2 maps in text.

Work among the coolies at the Negapatam Emigration Depôt showed that ankylostomiasis was endemic, and that 98·6 per cent. of 11,500 coolies harboured hookworm. It is, in fact, universally distributed in the rural areas of the southern half of the Madras Presidency and is only slightly less—91 per cent.—in incidence in the urban areas. The infection appears to be compatible with good health. Roundworms occurred in 60 per cent. and whipworms in 37 per cent. of the coolies. Later attempts were made to ascertain how far propaganda and free medical help can induce the population to adopt sanitary habits, and the location of the Inquiry was transferred to Dindigul and Trichinopoly Central Jail. No improvement was apparent after two years of field campaign. The infection was found to be mainly by Necator, and is, on the whole, light (averaging 22 per person). *Ancylostoma duodenale* varied from 10 per cent. to 80 per cent. with an average of 10 worms per person. Ground itch and dermatitis was invariably absent. Pronounced anaemia and emaciation were rarely noticed. Occult blood in stools long after hookworms have been removed indicates a possible reason for refractory cases of anaemia. Haemoglobin index bears no clear relation to the number of hookworms present. Flies can carry hookworm eggs and larvae. Humidity appears to be correlated with intensity of infection. Hookworm is a predisposing factor in bowel complaints and in influenza.

Natural death of infection (ova and larvae) in the night soil occurs within 14 weeks. The larvae occur naturally unsheathed and do not migrate from the place of development. Night soil can be safely used as manure after 6 months. For treatment in the field betanaphthol in 50-grain single dosage without purgative gives the best results and is sufficient to reduce 90 per cent. of hookworm infection.

R. T. L.

ADLER (S.). **The Hookworms of Man in Sierra Leone.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1925. Mar. 31. Vol. 19. No. 1. p. 138. [4 refs.]

From 38 prisoners and 9 post-mortems on natives of Sierra Leone 4,305 hookworms were collected in Freetown Jail. Among these, 3,929, *i.e.*, 91·3 per cent., were *Necator americanus*, the remainder, 376, *i.e.*, 8·7 per cent., were *Ancylostoma duodenale.* The largest number in a single case was 483 Necator. The highest number of Ancylostoma was 196. In *N. americanus* the females were about three times as numerous as the males, while in *A. duodenale* the sexes were about equal in number.

In Sierra Leone *A. duodenale* occurs both in man and in the civet cat, and is evidently in an intermediate zone between the areas of high frequency of *A. duodenale* in the north and *N. americanus* in central and south Africa.

R. T. L.

RENNER (E. A.). **Report on Ankylostomiasis at Makeni, Northern Province.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* (Appendix VIII.) pp. 67–68.

Of 116 men, women and children connected with the West African Frontier Force examined by the author 26, or 22·41 per cent., were found to harbour hookworms. No children under the age of 10 years were infected. One case of conjunctivitis and one of profuse lachrymation, which had proved refractory to the usual forms of treatment, cleared up on administration of thymol given for an accompanying ankylostome infection.

H. H. S.

EASMON (M. C. F.). **Report on Ankylostomiasis at Bo and Pujehun.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* (Appendix IX.) pp. 69–70.

Of 100 persons examined at Pujehun, prisoners and admissions to hospital, 45 were found infected with hookworm ; of 84 at the Kennema Prison, Bo, 40 (47·6 per cent.) ; and of 152 at the Bo school 68, or 44·7 per cent. These figures are regarded as fairly representative of infection over the Central and Southern Provinces of the Protectorate. 26·6 per cent. were free from all helminthic infection. Ankylostomiasis is not, apparently, severe, since only some 3 per cent. showed any symptoms.

H. H. S.

Callender (G. R.) & Bitterman (Theodore). **The Influence of Army Service on the Incidence of Hookworm Infection in the Philippine Scouts.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 251–253. [8 refs.]

The incidence of hookworm infection in Filipino soldiers varies, roughly, inversely as the length of service and decreases rapidly from the fourth to the tenth years. The infection rate with Trichuris remains practically constant during army service. A survey of 933 Filipino troops gave the following results :—

Service in years.	Hookworm.		Ascaris.		Trichuris.		Negative.		Total No. of cases.
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	
1 or less ...	138	77	27	15	134	74	13	7	180
Over 1 to 4 ...	221	72	24	8	236	76	21	7	309
Over 4 to 7 ...	74	53	20	14	94	68	20	14	139
Over 7 to 10...	29	26	9	8	81	72	23	20	113
Over 10 ...	35	18	31	16	125	65	54	28	192
Totals ...	497	53	111	12	670	72	131	14	933

The hookworm infection rate in recruits to the Philippine Scouts is approximately 75 per cent., and has remained practically constant for a period of about 20 years.

R. T. L.

Stoll (Norman R.). **Investigations on the Control of Hookworm Disease. XXXIII. The Significance of Egg Count Data in** *Necator americanus* **Infestations.**—*Amer. Jl. Hyg.* 1924. Sept. Vol. 4. No. 5. pp. 466–500. With 4 text figs. [8 refs.]

Hookworm infection and hookworm disease appear to be passing from the domain of clinical medicine and of helminthology to that of higher mathematics. Thus, in this thirty-third paper of a series on Hookworm Investigation, we learn after 18 pages of discussion that the relationship between stool and egg-count is worked out by the formula :

$$\Omega = \frac{n.\Sigma xy - \Sigma x.\Sigma y}{\sqrt{[n.\Sigma x^2 - (\Sigma x)^2]\ [n.\Sigma y^2 - (\Sigma y)^2]}}$$

The author set out to find what constancy there might be in the day-to-day output of eggs from a given human host, and whether the egg-count measures the size of infestation, relatively or in the number of worms harboured. The total faeces passed over a long period were collected daily, and diluted in the proportion of 3 gm. faeces to 45 cc. decinormal NaOH. The daily variations are diminished by what are called " running averages " of two, three, or more day periods. We have also to take into account the fact that a formed stool really constitutes a concentration of ova, or, in other words, in a " mushy " stool there is a " natural dilution of the ova before counting." As this is in a ratio of about 1 to 2, in making the calculation if the stool is mushy its " size in grams " is halved and its egg-count doubled [this would appear to make the ratio 1 : 4]. The count is therefore, to ensure greater accuracy, reduced to the " basis of formed faeces." Previous determinations in Porto Rico have indicated an average of about 9,000 eggs per day for each female worm.

H. H. S.

DAVIS (Nelson C.). **Experience with the Stoll Egg Counting Method in an Area lightly infested with Hookworm.**—*Amer. Jl. Hyg.* 1924. May. Vol. 4. No. 3. pp. 226–236. [5 refs.]

Stoll's method applied to a group of 67 residents of Cachoeira, in Brazil, gave a series of figures indicating that the number of eggs per female hookworm per day and the number of eggs per female per gram of faeces were much greater in this locality than those given for Porto Rico by STOLL. Stoll's constant 44, representing the number of hookworm eggs per female per gram of formed faeces, would give an altogether erroneous idea of the infection rate, the constant arrived at by the author being 70. It is suggested that diet may have influenced the difference. To those dealing with hookworm a table is added showing the relation of the egg count to the number of ascaris females passed after treatment. An enormous variation occurred from case to case as in the hookworm cases. The author considers that it is more valuable in treatment campaigns to know the actual infection rate, although for purposes of sanitation it may be " important to know the number of eggs deposited on the soil." For practical purposes of estimating infestation the examination of one or two direct smears and the Willis brine-flotation method give sufficiently reliable data for routine inspections.

R. T. L.

MANALANG (C.). **Ankylostomiasis. I.—Laboratory Diagnosis of Hookworm Infection.**—*Jl. Philippine Islands Med. Assoc.* 1924. Nov. Vol. 4. No. 11. pp. 421–424.

This paper appears to be the first of a series. The question of the laboratory diagnosis of hookworm infection is dealt with. The superiority of concentration and culture methods over direct smears from the stool is shown. The author employs for the former a modification of the method of CROPPER and ROW, using gasoline in place of ether. Explanations are given for the failure to diagnose infection though worms are present, *e.g.*, absence of ova in the faeces, the worms being males only, or the females being immature. The paper gives some useful hints for those commencing work on these parasites, and not in touch with previous literature.

H. H. S.

SVENSSON (Ruth M.). **A Morphological Distinction between Infective Larvae of Ancylostoma and Necator.**—*Proc. Soc. Experim. Biol. & Med.* 1925. Jan. Vol. 22. pp. 261–262.

By keeping the larvae of Necator and Ancylostoma in moist sand for five weeks and more the attenuated larvae show a difference, believed to be generic, at the point of union between the oesophagus and intestine. An open space is distally marked off by a definite transverse line in Necator, while in Ancylostoma larvae the intestine follows directly upon the oesophagus.

R. T. L.

OUDENDAL (A. J. F.). **The Intestinal Wall in Cases of Ankylostomiasis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore 1923.* pp. 280–285. With 7 figs.

The intestine of a patient infected with ankylostomes is characterized by the thick moist anaemic appearance of the rugae of the small intestine. The lytic, indeed histolytic, action of the parasite in the tissue is described and illustrated. There are always many ulcers. The ulcer itself is very deep with the form of a groove the base of which is formed by necrotic tissue and dense infiltrations with leucocytes and lymphocytes. In sections of ulcers stained both by Gram and with methylene or toluidine blue not a single micro-organism is to be found. Ankylostome ulcers heal and a series of many large epithelial cells in the form of tubes and with nuclei containing much chromatin is to be seen amongst normal intestinal epithelium. As a rule the muscularis mucosae has become partially or wholly lost on the site of these epithelial proliferations and the new epithelial cells are in direct contact with the connective tissue.

R. T. L.

DJAMIL (Mohamed). **An Investigation into the Renal Function in Ankylostomiasis.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 270–280.

In uncomplicated ankylostomiasis there is no increase of bilirubinaemia or urobilinuria. The anaemia must therefore be produced in some other way than by a haemolytic process. The appearance of the blood with the presence of achromasia, pessary-shaped corpuscles, anisocytosis, and in severe cases poikilocytosis, indicates an aplasia or degeneration of the bone marrow. The orange-yellow colour of the face even in the dark-coloured inhabitants of the tropics, the slower growth and development of the children, the enlargement and hypertrophy of the left side of the heart, all suggest the operation of a toxic process. As the excretion by the kidneys of toxins gives rise to unfavourable consequences the author has ascertained the Ambard's constant for sufferers from ankylostomiasis. He concludes that it is possible to decide with absolute certainty that, with sufferers from ankylostomiasis with typical symptoms, there exists a disturbed function of the kidneys resulting in an abnormal excretion which can only be explained by the action of a powerful toxic influence, either unknown albumens or toxins, on the organism and not as a result of the anaemia on the kidney epithelium.

R. T. L.

ACKERT (James E.). **Notes on the Longevity and Infectivity of Hookworm Larvae.**—*Amer. Jl. Hyg.* 1924. May. Vol. 4. No. 3. pp. 222–225. [5 refs.]

A quantity of sheathed hookworm larvae (probably *N. americanus*) taken from Trinidad to Manhattan remained alive in a culture of cistern water for one year and a-half. The temperatures varied from 45° to 98° F., fluctuating mostly from 60° to 85° F. GOODEY's laboratory method for testing skin infection [with, however, parchment replacing the live rat skin !] showed that these larvae were no longer infective, although they responded to heat stimulation. A considerable number of empty sheaths were present in the 18-month old culture, but unsheathed larvae were seldom found alive.

R. T. L.

CHANDLER (Asa C.). **Animals as Disseminators of Hookworm Eggs and Larvae.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 533–537. [14 refs.]

The devouring of faeces by pigs, rats, dogs or other animals, possibly with the exception of chickens, cannot be looked upon as a desirable destruction of refuse, but rather as a very dangerous process resulting in the dissemination of the eggs of human intestinal parasites. The author has repeated the experiments of GORDON, ACKERT, PAYNE and GOODEY, and has failed to infect three young pigs with *Necator americanus* larvae. The results are not conclusive, but in his opinion merely indicate that the pig is not readily susceptible to infection with *N. americanus.* "The close relationship parasitologically, between pigs and man, would lead one to hesitate to separate specifically parasites found in these two hosts unless the differences shown by them were very well marked."

Feeding experiments on pigs, rats and dogs are detailed, which confirm previous work and show that viable hookworm eggs can be disseminated in the faeces of these animals after feeding on infected human faeces.

R. T. L.

MANALANG (C.). **Note on *Ancylostoma braziliense* as a Human Parasite in the Philippines.**—*Jl. Parasit.* 1924. Dec. Vol. 11. No. 2. p. 90. With 1 text fig.

A. braziliense has been found by the author in the dog in Manila. It occurred also in over 11 per cent. of 136 hospital cases treated for hookworm infection from three provinces of Mindanao and Sulu and one province of the Visayan group. They were always observed in Filipinos, never in Americans, Chinese or Japanese. The incidence was about 1 per cent. in 1,000 parasites collected from 115 inmates in a penal farm. In every case the number present was small.

R. T. L.

WASHBURN (B. E.). **The Economic Value of a Hookworm Campaign.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 613–623. With 3 charts. [United Fruit Company, Boston, Mass.]

In seven rural and one urban area of Jamaica the Rockefeller Hookworm Commission conducted campaigns between 1920 and 1923, which received the co-operation of over 99 per cent. of the population. The results demonstrate their marked economic value from the standpoint of the community, the employer, and of the individual. The most important result from the standpoint of the community has been the marked decrease in sickness, especially from typhoid and dysentery. Better conditions of health with increased resistance against contagions and the capacity to do more work and earn more money are among those results which tend to improve the lot of the individual., Tables and typical replies to queries addressed to estate managers bear out the author's remarks.

R. T. L.

DESTÉFANO (Francisco) & VACCAREZZA (Raúl F.). **Tratamiento de la anquilostomosis por el tetracloruro de carbono.**—*Semana Med.* 1924. No. 10. 32 pp. [28 refs.]

Carbon tetrachloride is the best vermifuge in human ankylostomiasis. Its advantages over other anthelmintics are: Greater efficiency, equal or less toxicity, determinate constitution, easy administration, and very low price.

It must be given on an empty stomach, in the maximum dose of 3 cc. for adults and at the rate of 0·2 for every year of age in children, after a saline purgative. It should be administered only twice to the same person, and an interval of 20–30 days must elapse between the first and second dose.

In more than 60 per cent. of the cases complete cures, from the microscopical point of view, are obtained by a single dose, while in the remainder the majority of the ankylostomes are eliminated. The proportion of cures obtained by administration of Oleum chenopodii is 30 per cent.

Toxic effects of carbon tetrachloride, when given in the maximum dose, are absent or of no significance if the drug is sufficiently pure and precautions are taken to avoid as far as possible intestinal absorption and if the subject shows no sign of hepatic insufficiency. Its use therefore is contra-indicated in alcoholic subjects.

From the point of view of the practitioner who has no occasion or possibility of verifying the anthelmintic action of the drug, the following lines of treatment should be adopted:—

For treatment " en masse " two cures should be prescribed within the indicated doses, with an interval of 30 days between the first and second. The interval enables the liver to restore its deranged function and gives larvae in the organism of the patient time to develop into mature worms which should be eliminated by the second dose.

In individual treatment 15 days later chenopodium oil (1·5 cc.) should be given: the patient is then supposed to be cured.

R. T. L.

KHALIL (M.). **Carbon Tetrachloride as an Anthelmintic in** *Ancylostoma duodenale* **Infection.**—*Reports and Notes of the Public Health Laboratories Cairo. No. 6.* 1924. pp. 79–93. [27 refs.]

Experience during 1923 of more than 4,000 cases has fixed the optimum dose of carbon tetrachloride for *Ancylostoma duodenale* at 5 cc., followed by a saline purge. Khalil points out that at least a week must elapse before the stool should be re-examined for ova; otherwise an incorrect conclusion as to the effectiveness of the drug may be reached. Most ankylostomes are passed during the first 24 hours, while ascarids are passed during the second day. Carbon tetrachloride was found to be much more effective than Ol. chenopodii or thymol for ankylostomes, but less so than Ol. chenopodii for ascarids.

T. W. M. C.

SOPER (Fred. L.). **Treatment of Hookworm Disease with a Combination of Carbon Tetrachloride and Oil of Chenopodium. Comparison of Results of Simultaneous and Delayed Administration of Magnesium Sulphate.**—*Amer. Jl. Hyg.* Baltimore. 1924. Nov. Vol. 4. No. 6. pp. 699–709. [9 refs.]

The work on which this report is based aimed at determining: (1) The degree of infestation and species of hookworm harboured by Paraguayan soldiers; (2) the efficacy of treatment by combined carbon tetrachloride (1·8 cc.) and oil of chenopodium (0·6 cc.); (3) the comparative effects of a purgative of magnesium sulphate when given simultaneously with the anthelmintic and when given two hours later.

As regards the first point, infestation was found to be very heavy, and 90 per cent. of the worms were Necator. The combined drugs proved very effective, and no case of toxic action was met with. As regards the third point, it was found that the anthelmintic action of the drugs and purgative was almost the same in both, but that when the magnesium sulphate was given simultaneously with the drugs expulsion was often delayed for 24 hours. The anthelmintic action itself did not seem to be affected, for the worms passed on the second day after were found to be partly digested.

H. H. S.

SMILLIE (W. G.) & PESSOA (S. B.) **Treatment of Hookworm Disease with a Mixture of Carbon Tetrachloride and Ascaridol.**—*Amer. Jl. Trop. Med.* 1925. Jan. Vol. 5. No. 1. pp. 71–80. [9 refs.]

An interesting series of experiments is here recorded, showing the superiority of a combination of carbon tetrachloride and ascaridol over other anthelmintics. In the first group of patients treated adults were given 2 cc. of carbon tetrachloride at 6 a.m., and an hour later 0·5 cc. of ascaridol; at 8 a.m. a saline purgative. These doses are well below the toxic limits of either drug; nevertheless, 98 per cent. of the worms harboured were passed. To a second group was given a mixture of 4 parts carbon tetrachloride and 1 part ascaridol, 2 cc. being the dose for adults, divided into two doses, and given at an hour's interval. As a result 92·6 per cent. of the total number of worms were passed.

Smaller doses were less effectual than these last, though considerably better than either of the drugs separately. The toxicity is not increased by the combination. The efficiency, however, is much reduced if the drugs are combined with castor oil.

It was found also that carbon tetrachloride had a selective action on female hookworms, while ascaridol attacked the males and also was effective in removing Ascarides for which carbon tetrachloride is almost useless.

H. H. S.

SWEET (W. C.). **The Effect of Carbon Tetrachloride on the Egg-Laying Powers of the Female Hookworm.**—*Amer. Jl. Hyg.* Baltimore. 1924. Nov. Vol. 4. No. 6. pp. 691–698. [5 refs.]

At a resurvey of the Queensland Hospital for the Insane 26 persons were found infected with hookworm. Egg-counts by Stoll's method were made on samples of faeces from each for three successive days.

The patients were then divided into three groups. Those of the first, comprising 9 males, were given 1 cc. of carbon tetrachloride in water; the second and third groups, of 8 and 7 females, were given 1·5 cc. and 2 cc. respectively, and egg-counts were made daily for the succeeding 10 days.

It was found that the effect of the drug on the egg-laying power of the ancylostomes was but slight, and that all inhibition had disappeared at the end of a week. The author found indications tht the female *Ancylostoma* has some five times the egg-laying power of the *Necator.*

H. H. S.

DAVIS (Nelson C.). **Hookworm Infection as influenced by the Wearing of Shoes.**—*Amer. Jl. Trop. Med.* 1925. Jan. Vol. 5. No. 1. pp. 81–86. [3 refs.]

From investigations carried out by the author as to the relative amounts of infection by hookworm amongst various age groups and in both sexes of workers in the fields in a part of the State of Rio Grande, it is concluded that the wearing of shoes has a definite beneficial effect, as would be expected. Actual figures, however, lose a good deal of their value, since "shoes" may be merely wooden-soled slippers which would afford little, if any, protection, and also since some of those who wear shoes discard them temporarily when at work.

H. H. S.

KHALIL (M.). **The Classification of the Family Ancylostomidae.**—*Reports and Notes of the Public Health Laboratories Cairo. No. 6.* 1924. pp. 195–196. [6 refs.]

This classification agrees with that of LANE (1917), except that the sub-family *Bunostominae* is re-established in accordance with the Rules of Nomenclature. A key is given for the identification of the genera.

T. W. M. C.

KAMEYAMA (Shin). **[A Contribution to the Diagnosis of Ankylostomiasis by Eosinophile.]**—*Okayama Igakkwai Zasshi* (*Jl. of Okayama Med. Soc.*). 1924. July. No. 414. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 338.]

The eosinophile cells increase in absolute number and in the percentage of white cells in inflammatory as well as non-inflammatory cases of ankylostomiasis.

R. T. L.

ALLES (E. C.). **Acute Intestinal Obstruction caused by Dense Accumulation of Round-Worms.** [Correspondence.]—*Brit. Med. Jl.* 1924. Nov. 29. p. 1001.

BEERS (G. H.). **Removal of *Filaria Loa* from Conjunctiva.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 8. Vol. 83. No. 19. p. 1507.

CAWSTON (F. G.). **The Source of South African Trematodes.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 343–346.

——. **Occasional Hosts of Some South African Trematodes.**—Reprinted from *S. African Jl. of Science.* 1923. Dec. Vol. 20. pp. 351–353. [5 refs.]

DEEKS (W. E.). **The Cause of Hookworm Disease, its Prevention and Cure.**—12 pp. With 13 figs. [Issued from the Medical Department, United Fruit Company, Boston, Mass.]

GEDOELST (L.). **Notes de parasitologie congolaise.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 247-253.

HAIM (Emil). **Ueber durch Spulwürmer verursachte Komplikationen nach Magen-Darmoperationen.**—*Zentralbl. f. Chir.* 1924. Apr. 12. Vol. 51. No. 15. pp. 790-791. 5 refs.

PHILP (H. R. A.). **Clinical Signs due to the Presence of** *Ascaris lumbricoides.*—*Kenya Med. Jl.* 1924. Oct. Vol. 1. No. 7. pp. 203-206.

PODIAPOLSKY (Barbara). **Zur Kenntnis der Fauna der parasitischen Würmer bei Ratten.** [Abstract.]—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 4. pp. 309-310. With 1 plate. [In Russian pp. 280-290.] [7 refs.]

STULZ (E.) & FONTAINE (R.). **Un cas de Filariose de Médine.**—*Bull. Soc. Française Dermat. et de Syph.* 1924. July. No 7. pp. R.S. 88-R.S. 91. [Réunion dermat. de Strasbourg.]

REVIEWS AND NOTICES.

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates. Edited by PHILIP H. MANSON-BAHR, D.S.O., M.A., M.D., D.T.M. & H. Cantab., F.R.C.P. Lond. Eighth Edition, Revised. pp. xx+895. With 20 colour plates, 7 half-tone plates, 387 figures in the text, 6 maps and 33 charts. 1925. London, New York, Toronto and Melbourne : Cassell & Company, Ltd. [Price 31s. 6d. net.]

In the preface to this, the eighth edition of perhaps the best known text book of Tropical Medicine, the editor alludes to the death, since the publication of the last edition in 1921, of Sir Patrick MANSON, the original author, and states, in regard to the present volume, that while founded upon his teaching and embodying not a little of his writing, it has been drastically revised and, indeed, remodelled in order to bring it abreast of the latest developments in this province of medicine. The section on Medical Zoology has been entirely rewritten. Many fresh illustrations have been inserted, including six skeleton disease-distribution maps. The volume remains essentially a text-book and covers the ground of tropical diseases in 630 pages and, without taking on encyclopædic form, deals adequately with Medical Zoology in an appendix of another 230 pages. The arrangement of the contents may not meet with the approval of all, but, in any case, it is simple, and the subject-matter easily accessible and up to date. Some may question the advisability of including the zoological appendix at all in a text-book of tropical diseases, but, on the whole, it is useful for the tropical practitioner to have this part of the subject under the same cover. At the same time the space given up to snakes would seem to be unnecessarily great.

There is some evidence that the book has suffered in some sections from revision, and perhaps hurried writing, so that in the description of a disease its entity does not unfold itself in a harmonious picture, but rather as a patchwork of symptoms and pathological findings. This is of course common, unfortunately, to nearly all medical text-books, and arises from following the methods of our ancestors, who had only signs and symptoms to describe together with macroscopic post-mortem material. The time has surely come, and why should not tropical medicine lead the way, when the pathogeny and underlying pathological changes in disease should no longer be divorced from the clinical description, but the two correlated as direct cause and effect. Take pellagra as an example: I am afraid the student reading the individual sections dealing with the pathological changes in the nervous system, and with the nervous symptoms, would have but a confused idea of this aspect of the disease. All the changes in the spinal cord are identical with those of subacute combined degeneration of the cord as seen in this country, and are typical of those produced by a toxaemia. It is, then, obvious that the disease cannot be due specifically to a dietetic deficiency, though it remains possible that only in the absence of some food principle does the toxin act. Such an idea one is glad to see mentioned by the editor in connexion with beriberi; why not in pellagra? It is a point not sufficiently insisted upon in dealing with so-called deficiency diseases. The absence of a "something" cannot produce anything; rather in the absence of a "something" something else may act.

Again, for the student, many phrases are ambiguous or the sense obscured. Referring to anaesthesia in the diagnosis of macular eruptions in leprosy, the following occurs: "In no other skin disease is definite anaethesia a symptom," suggesting that leprosy is itself a skin disease, or under yaws pathology: "No visceral changes have been found peculiar to yaws," suggesting that visceral changes are found in cases of yaws, but that they are common to other diseases. In dealing with the differential diagnosis of malaria the author says, "marked excess of polymorphonuclear leucocytes would be in favour of hepatic abscess," without stating whether this refers to a relative or absolute excess.

In the same section "urethral fever" is referred to—a term not in general use as far as the reviewer knows. A "pseudo-positive Wassermann reaction" in malaria is also alluded to: if a reaction is positive, it is positive whether it occurs in a case of syphilis or malaria. In this connexion the editor states that a positive reaction obtains in 28 per cent. of cases of malaria in the acute stage, a statement which has been contradicted by other observers. There are, naturally, opinions expressed which may not be accepted by others, and some inaccuracies. Under sprue the proportion of fatty acids to neutral fats is given as 1 : 3, whereas this should be reversed.

There is evidence, too, that some statements which found their way into the text of past editions have not yet suffered, at the point of the blue pencil, the penalty of being incorrect. The bare statement that "in all cases of nodular leprosy the testes atrophy" is hardly a correct statement of fact, and most of those who have studied yaws will not allow that in that disease "the primary lesion may appear as a vesicle which develops in a few days into an ulcer with an undermined granulating base."

One welcomes the section dealing with coli infections as a valuable addition, and one hopes that in a subsequent edition the subjects of tuberculosis and syphilis among native races will receive a place.

It is, of course, impossible to review fully a text-book, and, indeed, unnecessary in the case of this well-known and deservedly popular volume. The criticisms made above are merely offered as suggestions when the time comes for the ninth edition.

Hugh S. Stannus.

KENNEDY (Alex. Mills) [M.D. (Glas.), Professor of Medicine, University of Wales, etc.]. **Parasitology for Medical Students.**—pp. x+142. With 1 coloured plate & 61 text figs. 1925. London: Oxford Medical Publications. Humphrey Milford. Oxford University Press. [Price, 10s. 6d. net.]

Parasitology has long been the Cinderella of the British medical curriculum, and any attempt likely to raise this science from its present lowly position therein merits most cordial support. The reader who takes up this volume in the hope of finding some material contribution towards the desired end is doomed to disappointment.

The book contains six chapters; one (41 pages) deals with "Insects and Arachnoids," three chapters (51 pages) are devoted to Helminths, while "Protozoa," "Spirochaetes and Fungi" take up the remaining 46 pages.

The parasites selected for consideration are described, generally speaking, in a confused medley of undifferentiated familial, generic and other characters, often ill-balanced from inclusion of unimportant details and omission of points of real diagnostic significance. In few instances could any specific identification be based on the accounts given, and sometimes characters are described which would absolutely exclude any specimen from the species under consideration. For example, the thorax of *Stegomyia fasciata* is said to be covered with flat scales. And what purpose is served by telling students that "the common rat flea" "resembles *Pulex irritans*, but is yellow and possesses more bristles on its head"? That ancient fable regarding the specific significance of the wing venation of *Musca domestica* crops up again. One might hold the printer responsible for the cryptic saying that the mosquitoes of medical importance are "the Anophelinae and the Culicidae," but the endowment of *Ornithodorus moubata* with a head seems to render this charitable assumption unnecessary.

The pages bristle with similar mistakes. The trophonucleus of *Trypanosoma rhodesiense* is described as " usually " sited near the posterior end of the parasite, and it is clear that the author has never observed the development of ancylostome larvae for himself. Head and body lice are said to possess 7 and 8 abdominal segments respectively, and the spiracles of *Pediculus* (sic) *pubis* are confused with the lateral abdominal protuberances. The author is unjustifiably dogmatic regarding the skin appearances produced by certain insect bites, and would be more guarded in his statements if he had compared the varying skin lesions caused by feeding the same biting insects on himself and on others.

The foregoing recital of inaccuracies and misstatements—which is far from complete—sufficiently indicates the scientific status of this publication, and the reviewer finds nothing to counterbalance its obvious shortcomings. Zoological classification and systematic nomenclature—those stumbling blocks to the beginner—are calmly ignored, grave omissions in a work professedly written for elementary students. Indeed, the reader will search the book vainly for any exact knowledge of the parasites included, or any grasp of the fundamental principles of medical zoology.

This is a dangerous book for the student at a period when he is convinced of the plenary verbal inspiration of his text-books.

W. P. MacArthur.

RODENWALDT (Ernst). **Kaart en determineertabel van de anophelinen van Nederl. Oost-Indië.**—3 pp. With 1 folding table & 20 figs on 2 folding sheets attached in case. 1924. Batavia: Topografische Inrichting.

The differential characters of the Netherland East Indian species, 20 in number, considered by the author to be distinct, are clearly tabulated, and are also illustrated by enlarged semi-diagrammatic figures, along with statements of the breeding-places and pathogenic significance of each one.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 7.

UNDULANT AND ABORTUS FEVERS.

AUCHÉ (Bernard). **Etiologie, pathogénie, et prophylaxie de la fièvre ondulante.**—*Ann. d'Hygiène Publique Indust. et Sociale.* 1925. Mar. Vol. 3. New Ser. No. 3. pp. 137–176.

The author gives an exhaustive resumé of our recent knowledge of the etiology, pathology and prevention of undulant fever. He describes very fully the alarming increase in its endemic areas particularly as affecting France, and gives a statistical table; 952 cases were recorded from 1920–1924 in France, 585 confirmed by laboratory methods. Up to May in 1924, there were no less than 338 cases, and it is likely, he states, that this is only about a third of the real number. Reviewing the controversy as to the unity of *M. melitensis* and *B. abortus* he agrees with BURNET that it is difficult, if not impossible, to separate them bacteriologically, but one is adapted for growth in goats and man, the other for cattle, though abortus possesses a great virulence for pigs. He thinks that the arguments of CREPIN (*ante*, p. 114) as to the *non*-infection of goats and sheep with melitensis are not sound, and he considers these animals to be the chief agents in its distribution.

The epidemiological section is well worth careful reading; the propagation of the disease by goats, sheep and other domestic animals, including the cat, and sometimes from man to man, is clearly stated. All the south of France has been already invaded and the rest of France is threatened. Prophylactic measures require to be rigorously enforced, as at present they are not effective. These are given in detail for man and animals, and include vaccination with abortus if further test with this organism should be satisfactory. The paper should be read in the original, as it gives, particularly from the French point of view, full information.

P. W. Bassett-Smith.

Burnet. **Les récentes acquisitions sur la fièvre méditerranéenne.**—*Bruxelles Méd.* 1925. Mar. 8. Vol. 5. No. 19. pp. 630-634.

The author points out that the extension of undulant fever from the coast inland is a very disturbing epidemiological factor. The disease has many analogies with tuberculosis, and the intra-dermal reaction of "melitine" like that of "tuberculin" is specific. He looks upon the two microbes (*melitensis* and *abortus*) as a single species differing only in pathogenicity, the latter being called *melitensis abortus ;* though he states that no one has ever been able to convert the one into the other, and he has never known abortus to give rise to fever in man, though in very large doses it can infect monkeys. Nicolle and Conseil have shown that it is possible to produce a prophylactic vaccine against undulant fever in man, but the author has not been able to immunize guineapigs against either melitensis or abortus. The extension of the disease necessitates increased hygienic precautions, chiefly the sterilization of milk before use, and the extinction of the disease in all animal carriers by vaccination, for which the abortus organism should be used ; in fact, this organism, being less dangerous and giving rise to similar serum reactions, is recommended for all prophylactic and therapeutic uses.

P. W. B-S.

Clearkin (P. A.). **A Review of the Recent Literature on Undulant Fever of Man and Contagious Abortion in Animals.**—*Kenya Med Jl.* 1925. Feb. Vol. 1. No. 11. pp. 337-341.

It is stated that *B. abortus* has been recognized in Kenya for many years, but the first case of undulant fever was found only three years ago. Thirty-one cases have now been recorded in the Colony, and many others have been suspected. Some of the early cases were definitely associated with drinking goat's milk ; in this colony therefore the goat is certainly incriminated. Great numbers drink unboiled cow's milk, but only one European has been known to develop undulant fever, and though the abortus disease is very common in cattle, no patient has been known to have had any connexion with cattle suffering from that disease. The author concludes that the case against cows causing infection with undulant fever is not strong, but it is a possible danger, and the moral is, "boil all milk."

P. W. B-S.

Duncan (J. T.). **The Rôle of the Domestic Cow in the Epidemiology of Undulant Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. No. 5 & 6. pp. 318-327. With 2 figs. [22 refs.]

This is a very careful and interesting paper relating to undulant fever in South Africa. Very few cases have so far been recorded of human infections by *B. abortus*. The author describes a case of Rhodesian undulant fever treated in the Tropical Diseases Hospital, London, and gives details of the laboratory investigations made there. The patient, a butcher, had been resident in Southern Rhodesia for 15 years. The disease was apparently contracted from cow's milk. Six months after the onset, the author isolated from the blood an organism indistinguishable morphologically and culturally from *M. melitensis*, but absorption tests showed it to be more closely allied to the abortus strains than to the melitensis ones tested. Many agglutination tests were made with different strains, and the author believes that the present evidence points to *B. abortus* as the cause of the disease both in cattle and man in Rhodesia, but there is as yet no trustworthy test which can distinguish the two organisms. Cultures of three strains of *B. abortus*, the isolated human strain B., and some of *M. melitensis* strains treated with lacrymal secretion gave no evidence of lytic action, and inconclusive results with certain soluble salts of organic acids which have been found valuable in differentiating organisms of the Salmonella group. On all culture media used, the growth of *B. abortus* and the isolated strain B. was more luxuriant than that of *M. melitensis* but was not diagnostic. The infection of Rhodesian cattle requires careful observation, and measures to prevent its spread from the endemic centres, since it must be looked upon as a danger to the human population ; more experimental proof is required to show whether the bovine infection is really pathogenic to man.

P. W. B-S.

i. FICAI (Giuseppe) & ALESSANDRINI (Alessandro). **Setticemia da "*Bacillus abortus*" (Bang) nell'uomo.**—*Policlinico.* Sez. Prat. 1925. Jan. 26. Vol. 32. No. 4. pp. 113–115.

ii. —— & ——. **La setticemia da "*Bacillus abortus*" (Bang) nell'uomo.**—*Ann. d'Igiene.* 1925. Jan. Vol. 35. No. 1. pp. 1–64. [68 refs.]

i. An interesting and suggestive paper, the subject matter of which, if confirmed, will help to clear up the distinction between infections by *M. melitensis* and Bang's bacillus. Two instances are recorded in which several persons in a district where goat's milk is not taken were attacked by fever resembling undulant fever after they had attended an aborting cow. The authors were able to isolate the *B. abortus* from the blood of two of the patients during the febrile period.

By the following technique the two diseases can be serologically differentiated. The serum before being inactivated should be diluted 1 in 50 with distilled water instead of saline, but after inactivation the subsequent dilutions are made with 0·9 per cent. NaCl. True anti-melitensis sera, after heating to 60° C. for half an hour, will agglutinate, but not if heated to 65° C., while "anti-Bang" sera agglutinate after being heated to the latter temperature and even to 70° C., but no longer do so if heated to 75° C.

ii. This long article may be regarded as an amplification of i. It is divided into 8 sections. The first reviews the present opinions generally held relative to undulant fever, and states that the disease transmitted to man from a sick cow, especially one which has aborted, is not a "melitensis" but an "abortus" septicaemia, and that the authors have definitely isolated the *B. abortus* from man. In the second the epidemiology and the distribution of the two diseases are dealt with, references being quoted in support of their statements and showing that the infection occurs with greater frequency in spring when abortion in cows is more common. The third section is devoted to showing that the prevailing idea that the two organisms are by serological tests identical is erroneous, and that by special methods the agglutination test may be employed to distinguish between them. The serum of a patient infected with *B. abortus* will resist, after dilution first with distilled water and later with saline [see above], a temperature of 75° C. for half an hour, whereas that from a case of *M. melitensis* infection loses its agglutinating power if heated to 65° C.; in other words, the anti-abortus serum is thermostable relatively to anti-melitensis. The succeeding section gives details of the clinical conditions and the serological findings in support of this last contention. In section 5 the authors give a more detailed account of the methods of isolating the *B. abortus* from man, and of its identification and pathogenicity for guineapigs. The organism is obtained by inoculating 5–10 cc. of the patient's blood into liver-broth anaerobically, with 1 : 10,000 gentian violet. Growth occurs in 12–14 days and the organism can be subcultivated on agar. This process takes advantage of the property of the *B. abortus* of growing better, in the early stages at least, in partial anaerobiosis. Another method is by direct intra-peritoneal inoculation of material into guineapigs. Death occurs between the twentieth and thirtieth days with purulent peritonitis and the organism is obtained again unmixed from the blood, spleen, liver and peritoneal exudate. Morphologically, on first culture Bang's organism is a definite bacillus and only resembles the cocco-bacillary form of *M. melitensis* on sub-culture. Section 6 gives the clinical differences between cases of abortus infection and undulant fever, the chief of which are that in the former there are daily remissions in the temperature, which ,however, remains high for some months, perhaps five or six, instead of the shorter periods of the latter with longer remissions of apyrexial periods; also, shivering is more frequent and sweating much more profuse in abortus infection, and complications are more severe, such as pyo-arthrosis, orchitis, otitis, pleurisy and peritonitis; finally, the mortality is greater.

The two last sections speak briefly of the use of vaccines in treatment of abortus infections in man, and of preventive measures.

The article is full of important points which will probably bring out the experiences of other workers in this field, and the agglutination tests, if found by others to be as specific as recorded here, will constitute a valuable means of differentiating the two organisms. The paper concludes with an extensive bibliography of nearly 70 references.

H. Harold Scott.

[The differentiation by heating of *abortus* from *melitensis* serum seems very simple, but many factors may come into play and the observations most certainly require confirmation from other laboratories. Heating serum to 65–69° for half an hour would render results of reading unreliable from coagulation of nucleoproteins; all other proteins coagulate at 70–85° according to acidity. (HAWK's Practical Physiological Chemistry. 8th Edit. pp. 249–250.) At 70° undiluted ordinary serum becomes solid.—P. W. B-S.]

VIVIANI (Rodolfo). **A proposito della questione della patogenicità del "Bacillus abortus" di Bang nell' uomo.**—*Policlinico.* Sez. Prat. 1925. Feb. 9. Vol. 32. No. 6. pp. 203–206. [19 refs.]

This is an inconclusive contribution to the study of the differentiation of *Micrococcus melitensis* infections from those by *Bacillus abortus.* Two cases are recorded, from each of which an organism was obtained by blood culture. The patient's serum in each case agglutinated in equally high dilution the two organisms, but the isolated bacillus was agglutinated a little better by melitensis serum (1 in 1,200 as against

1 in 1,000). The author concludes [as regards the former, at least; he makes no remark about the second] not very convincingly that "the diagnosis of Malta fever was undoubtedly the correct one."

H. Harold Scott.

BURNET (Et.) & CONSEIL (E.). **Présence du *Micrococcus melitensis* dans le lait d'une femme nouvellement accouchée ; résistance du nourrisson à l'infection par le lait maternel. Ce que suggere cette observation.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 121–125. With 1 chart in text. [7 refs.]

The authors report a most interesting case of undulant fever in a newly delivered woman (4th day). It was proved by agglutination and intradermic tests, treated with abortus vaccine, and the fever terminated on the 20th day. The woman suckled the infant, and up to the 7th month, although the micrococcus was isolated from the milk in small numbers, the child showed no sign of infection and gave no evidence of the disease serological or intradermic. The most interesting points are (1) though the mother must have been infected some time previously she did not abort ; (2) the case was cured by four injections of abortus vaccine ; (3) the child remained unaffected though suckled. In goats the infection of the milk is often heavy (1,000 to 3,000 per cc.) ; the milk of the woman gave only 2 per 0·5 cc. What is the cause of the immunity of the new born ? Was it transmitted through the blood of the mother ? and does this immunity occur in calves from abortus-infected mothers ? The evidence of WILLIAMS and HUDDLESTON is contradictory. It appears that even if the young develop antibodies in the blood they last only a short time as the animals may become chronic carriers though remaining in perfect health (QUINLAN).

The question whether the infant or calf can acquire the disease by the milk is most important. It must be remembered that it has been established experimentally by NICOLLE and CONSEIL for undulant fever, and by CALMETTE for tubercle, that immunity can be acquired by the digestive tract especially in young subjects. The observations recorded do not give any reply to the two questions, but they show how important it is to correlate the clinical and laboratory findings.

P. W. B-S.

ROZIÈS (H.). **Le fièvre de Malte chez l'enfant. (Un cas chez un enfant de 18 mois guéri en 20 jours par la vaccino thérapie.)**—*Progrès Méd.* 1925. Jan. 24. No. 4. pp. 129–133.

The author describes a case of melitensis infection in a child aged 18 months who made a rapid recovery when treated with iodized vaccine of RANGUE and SENEZ. The father contracted the disease first ; it ran a severe course and resisted the vaccine ; it was cured after 60 days under the influence of a fixation abscess. The child was separated from the father and is said to have been brought up on boiled goat's milk.

A discussion on the frequency of these infantile infections and their characters follows ; the author emphasizes his belief in the value of vaccine therapy in the treatment of the disease and states that his experience controverts the statements of COUVY as to its dangers.

P. W. B-S.

D'ARBELA (Felice). **Una sindrome emorragica precoce della febbre mediterranea.**—*Riv. di Clin. Med.* 1925. Feb. 15 & 28. Vol. 26. Nos. 3 & 4. pp. 89–96; 131–141. [31 refs.]

A lengthy description of a case of undulant fever, clinically mild, but in which haemorrhages appeared early, on the sixth day of disease. There was a purpuric rash on the trunk and limbs, with haematuria and passage of blood by the bowel. These symptoms did not clear up till the end of the second week. Medicinal treatment consisted in the administration of four injections of stomosine on alternate days. The remainder of the paper is devoted to a narration and discussion of previously recorded cases in which haemorrhage was a prominent feature, but in them the bleeding occurred later in the course of the disease. In the author's case there was no indication of a haemophilic tendency.

H. Harold Scott.

DARGEIN & DORÉ. **Des formes frustes de la mélitococcie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Jan. 29. Year 41. 3rd Ser. Vol. 49. No. 3. pp. 122–125.

The cases noted by the authors vary much from the typical forms. They describe two in detail which but for laboratory methods would have been undiagnosed, both having been treated as malaria. Autovaccine and injection of convalescent serum did not appear to cause any improvement, and no specific treatment had been given. The disease was traced to the ingestion of fresh unsalted unfermented cheese called "fromage cervelle," made from the milk of sheep or goats, and much prized by the population of Toulon. Its preparation is described in detail. It is recommended that steps should be taken to prevent the sale and consumption of these dangerous cheeses, a more important precaution than disinfection after contraction of the disease.

P. W. B-S.

DOMINGO (P.) & LOPEZ (C.). **Etudes sur la fièvre de Malte. Bacille de Bang et** ***Micrococcus*** **de Bruce ; méthode de différenciation.**—*C.R. Soc. Biol.* 1925. Mar. 20. Vol. 92. No. 10. p. 809.

The authors state that further experiments have confirmed their previous observations on the value of ox bile in reviving the specific characters of the *M. melitensis* for agglutination use, and reducing the non-specific action of old cultures. Not only is the melitensis organism rendered more reliable but by the same treatment the agglutinogenic properties of the *B. abortus* are also modified and therefore differentiation of the two organisms is assisted.

P. W. B-S.

BURNET (Et.). **Des réinoculations dans l'infection à** ***M. melitensis*** **en particulier d'après la maladie expérimentale du cobaye.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 62–82. [10 refs.]

It was demonstrated that reinfection of guineapigs with *M. melitensis*, if subcutaneous, caused a fever reaction; if in sufficiently large dose into the peritoneum, the animal dies with the formation of an abundant exudate and congestion of the abdominal organs.

Reinoculation provokes a local reaction analogous to that of KOCH, characterized rather by abscess formation than by necrosis, but less intense than that of tubercle. It is possible to distinguish a reaction due to the toxin and one to the microbe, so that the two reactions are not altogether independent. With guineapigs the reaction to "melitine" is more pronounced than that caused by the microbe bodies. These reinfections do not increase the susceptibility to the *M. melitensis*, and therefore their use for vaccine therapy is not contra-indicated. It was found that the inoculated microbes disappear rapidly from the infected animal; they are not eliminated in the bile or urine, but are attacked and destroyed by the phagocytes. The reaction of hypersensibility and the application which has been made of it for diagnosis constitutes a striking analogy between undulant fever and tuberculosis. The guineapig was found to be the animal most useful for the study of the various reactions caused by the *M. melitensis.*

P. W. B-S.

OCARANZA (F.) & VARELA (G.). [**Malta Fever in Mexico.**]—*A.M.M. Mexico.* 1924. Dec. Vol. 2. p. 615. [Summarized in *Jl. Amer. Med. Assoc.* 1925. Feb. 28. Vol. 84. No. 9. p. 713.]

The author states that a number of sporadic cases of a somewhat irregular type of the fever have been observed in Mexico, but no evidence of any endemic centres has been made out. The diagnosis is most surely determined by the intra-dermal reaction, which is stated to be constantly positive by the 7th to the 10th day, and persists for months afterwards.

P. W. B-S.

APPIETO (M.). [**Diagnostic de la fièvre méditerranéenne par l'intradermo-réaction de Burnet.**—*Thèse Fac. Méd. Montpellier.* 1924. 81 pp. [Summarized in *Bull. Inst. Pasteur.* 1924. Nov. 30. Vol. 22. No. 22. p. 891.]

For the differential diagnosis of undulant fever the author found that the intra-dermal reaction was the most satisfactory method. It was positive in 28 cases of undulant fever, and negative in 100 controls of various conditions other than this disease.

P. W. B-S.

FICAI (Giuseppe) & ALESSANDRINI (Alessandro). **Setticemia da "Micrococcu melitensis" e da "Bacillus abortus (Bang)" nell'uomo. Nota preventiva.**—*Riforma Med.* 1925. Jan. 19. Vol. 41. No. 3. pp. 57–58.

DENGUE, PAPPATACI AND UNCLASSED FEVERS.

HARRIS (William H.) & DUVAL (Charles W.). **Studies upon the Etiology of Dengue Fever. 1. Experimental Transmission to the Lower Animal.**—*Jl. Experim. Med.* 1924. [illegible] 1. Vol. 40. No. 6. pp. 817–833. With 2 text figs. [5 [illegible]

In the American epidemic described, the syn[illegible]re generally typical—moderately severe pyrexia with pri[illegible]l secondary waves, maculo-papular eruption and leucopenia. [illegible]nimal experiments were made from 16 human cases ; 143 guineapigs and monkeys were used for the initial transmissions and 43, representing 11 human cases, reacted in the characteristic manner. No spirochaetes were found by any means of observation.

In the experimental animals marked changes were found, consisting of endothelial proliferation in the lymphoid tissues and enlargement of the spleen and lymph glands. The constant and uniform results in all the positive cases indicate that the virus of dengue is not only transmissible to guineapigs but can also be propagated in these animals through an undetermined number of successive generations. Two strains have been continued for 36 and 45 generations.

P. W. Bassett-Smith.

DUVAL (Charles W.) & HARRIS (William H.). **Studies upon the Etiology of Dengue Fever. II. Cultivation and Nature of the Virus.**—*Jl. Experim. Med.* 1924. Dec. 1. Vol. 40. No. 6. pp. 835–844. With 3 plates and 1 text fig. [5 refs.]

The observations were made from cases in the same epidemic (see above). The authors found that minute organisms could be grown on the special media devised by NOGUCHI. They were globoid bodies ·1 to ·3μ in diameter, arranged singly, in pairs or in short chains; these readily pass through a Berkefeld filter (N & V) and the filtrate gives rise to a reaction in guineapigs, similar to that observed after the injection of the whole blood of a dengue case. Animals could be successfully inoculated with cultures several generations old. Initial cultures have been obtained direct from the whole blood of human cases as well as from infected guineapigs, but the earlier generations only retain sufficient virulence to cause the experimental reaction. No spirochaetal bodies were ever seen.

They conclude that the anaerobic globular bodies they have described may have an etiological relation to dengue, but recognize that further proof and confirmation of their work is required.

P. W. B-S.

D'EMPAIRE (Adolfo). **Sobre una fiebre de corta duración que se observa en Maracaibo.**—*Rev. Med. y Cirug.* Caracas. 1924. Aug. 31. Year 7. Month 10. No. 77. pp. 197–200.

Many new-comers to Maracaibo are attacked, some after a few days only, others after several weeks, by a sudden onset of acute fever up to 40° C. (104° F.) with intense headache, pain in the back and limbs, sometimes vomiting and albuminuria. A generalized rash appears on the second or third day and there is a slow pulse, perhaps 40 per minute. The symptoms clear up in 3 or 4 days, the slow pulse remaining for a few days longer. The idea was formerly prevalent that the disease was a mild form of yellow fever. Later it was regarded as dengue, but the general opinion now is that it is phlebotomus fever.

H. Harold Scott.

RUIZ (Villegas). **Un caso de fiebre de tres días o fiebre a papatacis.**—*Gac. Med. de Caracas.* 1924. Sept. 15. Vol. 31. No. 17. pp. 266-268.

Cases of fever of brief duration occurring at Macuto have by some medical men been regarded as pappataci fever, but others have denied this. The patient whose case is here recorded had come from Macuto, and two days later was suddenly attacked by shivering, intense headache and pains in the limbs, with a temperature of 39·5° C.and great prostration. The following day the pulse was slow, 60 per minute, and a scarlatiniform rash developed on limbs and trunk, but there was no sore throat. All the symptoms, except the bradycardia, cleared up in three days, and by the end of a week the patient felt quite well. The author regards this as an undoubted case of pappataci fever.

H. Harold Scott.

TRABAUD (J. P. R.). **La fièvre estivale de trois jours.**—*Arch. Méd. et Pharm. Milit.* 1925. Jan. Vol. 82. No. 1. pp. 25–49. With 1 fig. & 5 charts in text. [30 refs.]

The author gives a very full review of the short fever of the Eastern Mediterranean known as three day fever, a term he prefers to phlebotomus fever. Exception may be taken to the statement that it is essentially Mediterranean. In discussing the habits of the phlebotomus no mention is made of WHITTINGHAM'S work. He discusses rather fully its relation to dengue and tabulates the differences; most of the doubtful cases, he thinks, are abnormal dengue, the three day fever being typical, without eruption, often relapsing, having no direct complications but predisposing to other infections.

P. W. B-S.

PONTOIZEAU (E. M. M.) & DUTREY (M.). **Contribution à l'étude de la fièvre des trois jours (fièvre pappatacci). Son traitement par l'autohématothérapie (avec adjonction de faibles doses de novarsénobenzol.)**—*Arch. Méd. et Pharm. Milit.* 1925. Jan. Vol. 82. No. 1. pp. 50–59. With 5 charts. [11 refs.]

From their experience in Syria the authors divide the short fevers so common there into three day or pappataci fever, the most frequent and most benign, and dengue, which is much rarer. A description of the two diseases contains nothing new. They introduced autohaemotherapy as a method of treatment for three day fever and found it gave satisfactory results in a number of cases. As soon as possible after the onset of the disease about 20 cc. of blood is taken and 5 cc. of this is injected intramuscularly, a small quantity of novarsenobenzol in the syringe preventing coagulation. A second inoculation of about 10 cc. is given on the following day, and on the 4th and 7th days further injections, after a small intravenous injection of novarsenobenzol. The four injections cure by "shock." The treatment shortens the fever, reduces the pains, and the convalescent period shows none of the asthenia, anorexia, or depression which is so frequent and troublesome; recurrences also appear to be less common.

P. W. B-S.

WHITTINGHAM (Harold E.). **The Aetiology of Phlebotomus Fever.**—*Jl. Roy. Army Med. Corps.* 1925. Mar. Vol. 44. No. 3. pp. 196–203. [13 refs.]

In this restatement of his observations the author insists upon the importance of recognizing that *P. papatacii* is the most common vector, and of understanding the life history, development, and breeding of the insect.

P. W. B-S.

MEGAW (J. W. D.), SHETTLE (F. B.) & ROY (D **Typhus-like Fever, probably Tick-Typhus, in Central In** *Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 5 With 6 plates (2 coloured) & 3 charts.

Sixteen cases of a peculiar typhus-like fever, which occurred in the Saugor district, C.P., and affected 14 Europeans and 2 natives, were brought by letter to the notice of Megaw by Shettle, who was in charge of them. All had been exposed to tick bites, but no tick was ever found upon them. The fever was of an irregular remittent type, lasting about 14 days, with a petechial rash appearing from the third to the fifth day. There were no deaths, and no evidence of man to man infection. The Weil-Felix reaction was generally negative, as were all other serum tests. The cases differed from those described as tick-typhus of the Kumaon hills in that no evidence of tick infection was found; there was more conjunctivitis and greater remissions of the temperature. Animal experiments carried out in Calcutta failed to demonstrate a virus, but were an insufficient basis for conclusions. The cumbersome name of "jungle typhus-like fever" is provisionally given to this fever. Two indifferently coloured plates, four photographs and several charts are inserted.

P. W. B-S.

MEGAW (J. W. D.). **Indian Tick-Typhus.**—*Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 58–61.

The term "tick-typhus" appears to be the most appropriate name for what seems to be a definite disease in India, conveyed by means of ticks. The author in 1924 drew up a table of the typhus-like fevers conveyed by various vectors in different parts of the world, having in many ways a close resemblance to Rocky Mountain fever and to louse-borne typhus. It must be noted, however, that the evidence that the tick is the true carrier in India is only epidemiological; no scientific proof has yet been brought forward. It is nevertheless probable that lice, ticks, and mites do convey a typhus-like fever in different parts of the world, and the classification—louse typhus, tick typhus, and mite typhus—of the author is apposite. The characters of seven cases are set out in tabular form.

P. W. B-S.

BALFOUR (Andrew). **So-called Pseudo-Typhus.**—*Kenya Med. Jl.* 1925. Mar. Vol. 1. No. 12. pp. 352–358. [21 refs.]

This is an interesting short review of our knowledge of pseudo-typhus. Special reference is made to the work of MEGAW, but that author does not mention "fièvre boutonneuse" of CONOR & BRUCH (1910), which is here described; fevers of this description were found in Tunis, also by GABBI in Tripoli, and Balfour in Khartoum. Cases of typhus-like fevers have been described by MCNAUGHT from South Africa and by GILKS in Kenya. They appear to be spread by some insect vector not at present known, though lice seem to be ruled out; mites have been suggested. The likeness of these fevers to Brill's disease and Rocky Mountain fever has been referred to; MCNAUGHT thought the African type was Brill's disease; in many ways the Kenya fever is more allied to this than to "fièvre boutonneuse" of N. Africa. The typhus-like fever of Deli has by recent Dutch observers been proved to be carried by two forms of mites, *Trombicula deliense* and *T. schuffneri*; the virus, though not yet discovered, is possibly a spirochaete; this work should be followed up in Kenya.

P. W. B-S.

PRATES (Manuel Maximo). **Febre de carraças não recorrente endémica em Lourenço Marques.** [Non-Relapsing Tick Fever endemic in L.M.]—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6ª, 7ª e 8ª Sessões.) 1923. Aug. No. 4. pp. 327–341.

The endemic remittent fever of Lorenço Marques, associated with ticks of the genus Rhipicephalus, and possibly Amblyomma, is different from ordinary tick-conveyed relapsing fever. Two cases are described in detail, one benign, the other more acute. In both the patient had been previously bitten by ticks.

The former felt feverish and complained of pain in the inguinal region, with difficulty in walking, and the glands of the groin were tender. Just below the iliac spine there were some small scabs with a red areola. Examination of the centrifuged blood revealed "flagellates the size of *Spirochaeta duttoni* with poorly marked undulations." 30 cgm. of novarsenobenzol was given intravenously. The temperature rose to 38° C., and a discrete papular eruption appeared on the face, due, it was supposed, to the injection. The temperature fell and the infecting papule cicatrized leaving a pigmented macule. In the other case the symptoms were more severe. There were attacks of shivering, and the temperature rose in three days to 40° C. There were no malarial parasites found, and Widal's agglutination proved negative, but the white cell count showed a lymphocytosis of 47–53 per cent. There was, on the breast, a small, dark scab with a red border, like a small vaccinia pustule in the scab-stage; the neighbouring glands were enlarged and painful, and there were inflamed lymphatics traceable from the sore to the glands. A similar sore was seen on the right hip with corresponding lymphadenitis. The temperature did not reach normal for 9 days, and the glands continued painful for some time longer.

Treatment consisted in disinfection and cauterization of the primary pustule, in belladonna locally for the adenitis, and in the internal use of saline aperients, aspirin for the headache and backache, and, if spirochaetal infection was suspected, 914 intravenously. No fatal case has been recorded. The question of diagnosis is considered and the author concludes that the disease in many respects resembles Japanese river fever.

H. Harold Scott.

OHTAWARA (Toyoichi). **Recherches sur une fièvre endémique accompagnée de lymphadénite généralisée. Premier Rapport.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 819–832. With 2 charts in text. [5 refs.]

In the prefecture of Kumamoto a febrile disease with lymphatic enlargement, named Kagaminetsue, has been known in an epidemic form for many years; it started in the village of Kagami, hence its name. The author has for some years studied it but has not been able to find the pathogenic agent or any certain method of prophylaxis or treatment. He describes it as a specific acute endemic disease with generalized adenitis and remittent fever of two or three weeks' duration, having no complications and no mortality. Manual work in the fields is a predisposing factor and men suffer most. The onset may be sudden or gradual; the fever is accompanied by headache, malaise and often congestion of the mouth and throat. There is constipation, enlargement of the liver, spleen, and most of the lymphatic glands, an eruption of a dengue type and a slight leucocytosis.

It has to be diagnosed from malaria, enterica, dengue and spirochaetosis. It is transmissible to monkeys (Pithecus and Macacus) and guineapigs. Immunity is conferred by an attack. For treatment salvarsan was found effective, and though no etiological agent was demonstrated it is probably of a protozoal nature. Two cases are fully described and temperature charts are given.

P. W. B-S.

HONE (F. S.). **Further Cases resembling Endemic Typhus Fever (Brill's Disease).**—*Med. & Scient. Arch. of the Adelaide Hospital. No. 3.* (*Supplement to the Ann. Rep. Adelaide Hospital for the Year 1923.*) pp. 20–31. With 7 charts.

The author describes eight fresh cases of this disease treated in hospital and eight others reported from outside. The diagnosis on admission varied from measles to typhoid fever, but the course of the cases was similar to those previously described. Both males and females were affected and the cases were fairly distributed throughout the year. The incubation was about 10 days, the rash appeared about the 7th and defervescence on the 14th day.

With regard to the etiology the relation to food was again noticed in a few cases. The majority of the shop assistants who contracted the disease were from food or grocery stores, though in others no definite association with food could be found.

Dr. BULL reports a positive Weil-Felix raction in all the 16 cases, from 1/40 upwards—whereas in 61 control cases it was negative. Heating the serum to 56° C. for half an hour did not completely destroy the agglutinating power, but heating to 65° did.

P. W. B-S.

DE MELLO (Froilano), BRAS DE SÁ & COLOPO (Gonopote). **A evolução das concepções patogénicas da febre na India Inglesa e Portuguesa.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. July. 9th Ser. No. 7. pp. 309–319.

ROCKY MOUNTAIN FEVER.

i. SPENCER (R. R.) & PARKER (R. R.). **Rocky Mountain Spotted Fever: Experimental Studies on Tick Virus.**—*Public Health Rep.* 1924. Nov. 28. Vol. 39. No. 48. pp. 3027–3040. With 6 charts. [3 refs.]

ii. —— & ——. **Rocky Mountain Spotted Fever: Non-Filterability of Tick and Blood Virus.**—*Ibid. Dec. 26. No. 52. pp. 3251–*3255. [2 refs.]

i. " 1. In confirmation of earlier observations of previous workers, ticks of the species *D. andersoni* which have received the infection of Rocky Mountain spotted fever in the larval or nymphal stage retain it in the adult stage.

" 2. A 24-hour incubation at 37° C. of unfed hibernating nymphs and adults infected as larvae and subsequent injection of emulsions of such ticks into guineapigs give a higher percentgge of positive infection than the injection of similar ticks not incubated.

" 3. Infection of Rocky Mountain spotted fever in adult ticks subjected to winter temperatures (32° F. or below) may be demonstrated by the production of immunity in guineapigs following the injection of tick viscera immediately upon removal from cold temperatures, by a moderate but typical spotted fever following the injection of ticks after 24 hours incubation at 37° C., and by virulent spotted fever following tick feeding or the injection of ticks after feeding.

" 4. Control adult ticks free from all infection do not produce death or illness in guineapigs by feeding nor by injection of such ticks after feeding.

" 5. One infected adult tick may contain, after feeding, from 3,000 to 5,000 M.I.D. [minimum infectious doses] for a guineapig.

" 6. Emulsion of infected fed adult ticks treated with 0·5 per cent. phenol will protect guineapigs against 1 cc. of blood virus.

" 7. Nothing in the behaviour of blood or tissue virus is comparable to the changes observed in tick virus."

The killed virus of one fed tick is sufficient, injected, to protect a guineapig, but the period of immunity so produced is not yet known.

ii. Further experiments showed that the virus of Rocky Mountain fever as it occurs in the blood of guineapigs and in the emulsion made from infected ticks will not pass through a Berkefeld N. and V. filter, that the inoculation of the filtrates of blood or tick virus does not produce immunity in guineapigs, that the coarse V. filters which hold back the virus will readily pass cultures of *Staph. aureus*, and that this failure of the virus to pass through the filter does not depend upon any chemical affinity for, or adsorption property of, the filter substance.

P. W. Bassett-Smith.

CONNOR (Charles L.). **The Identification of the Organism of Rocky Mountain Spotted Fever in the Blood.**—*Jl. Infect. Dis.* 1924. Dec. Vol. 35. No. 6. pp. 587–590. With 2 text figs. [3 refs.]

The author was able to isolate the *Dermacentroxenus rickettsii*, or organism which he believed to be this, from the serum of infected animals, few in number but not differing from the forms described by WOLBACH and NICHOLSON in tick and animal tissues. Three methods were used—(1) Dilution of the serum with 5 vols. of normal salt solution and centrifuging at high speed for at least 6 hours; (2) Diluting the serum with distilled water, 1 in 5, and prolonged centrifugation; (3) Intraperitoneal inoculation of normal guineapigs, which were killed in about 48 hours, and smears made from the peritoneal exudate. He writes :—"The fact that it has been found in the blood and serum does not completely dispense with speculation as to the real form of the organism in this situation. The small numbers found may be present from broken-down cells and be quite accidental and transient. *The unusual virulence of the blood* (0·001 *cc. often being infectious*) *seems somewhat incompatible with the exceedingly small number of organisms found.*" [Reviewer's italics.]

P. W. B-S.

TAKEUCHI (Nobuyuki). **The Comparative Pathological Studies on the Rocky Mountain Spotted Fever. I. Morphological Researches on the Origin of the Disease.**—*Aichi Jl. Experim. Med.* 1924. Dec. 20. Vol. 1. No. 4. pp. 175–195. With 2 plates. [37 refs.]

The author, working with Prof. HAYASHI on material supplied by PARKER in America, reports the result of his investigations which confirm the work of HAYASHI. Monkeys, guineapigs, rabbits and rats were used ; the former were the most susceptible, the symptoms and pathological findings agreeing most closely with those seen in man. Four different morphological conditions of the organism are described : (1) The spirochaetal, rare ; (2) filamentous ; (3) bacillary forms ; (4) coccoid. These were all found in *smears* and sections of organs, so that they are looked upon as being different stages in the life cycle of the same organism, but whether spirochaetal or Rickettsial is not yet determined. A good deal of the work is in accord with that of RICKETTS, WOLBACH, PARKER and others, but special attention is drawn to the presence of the different forms of the organism described in the parenchymatous cells of the liver and kidney, as well as in the endothelial cells of the blood vessels ; the organisms are found also in the testis, spleen, lymph nodes and skin. They may be intra- or extra-cellular, or on the erythrocytes ; examples of the different forms are shown in the micro-photographs.

[It should be noted that WOLBACH in a private letter discounts the value of these findings since the technique used and the specimens seen were not satisfactory or conclusive (see this *Bulletin*, Vol. 21, p. 927).]

P. W. B-S.

SLEEPING SICKNESS.

SCHWETZ. **Rapport sur les travaux de la Mission médicale anti-trypanosomique du Kwango-Kasai 1920-1923.**—*Ann. Soc. Belge de Méd. Trop.* 1924. July. Vol. 4. No. 1. 137 pp. With 21 figs & 5 maps.

This number is an account of the work of the anti-sleeping sickness mission of Kwango-Kasaï during the first three years (1920–1923) of its activities. The mission was organized as the result of a preliminary survey of Kwilu in 1918.

The report commences with a brief summary of the state of affairs found in Kwilu in 1918 : in four months' examination it was found that about 7·5 per cent. of the total inhabitants were infected, and this serious state of things rendered it necessary to undertake an active campaign with a view to check the epidemic.

After a chapter dealing with the value of gland palpation as a means of diagnosis, an account is given of the state of sleeping sickness and what is being done to combat it in the eight divisions into which the territory has for sleeping sickness prophylactic purposes been divided, viz., Kikwit, Bulungu, Kandale, Niadi, Kamtsha-Lubue (Kasaï), Bas-Kwilu (Kwango), Bapende (Kasaï) and Lukula (Kwango). The first of the districts where the work started in 1920–21 has been re-examined twice since, viz., in 1922 and 1923 ; Bulungu and Kandale have each been re-examined once, Niadi is in the process of being re-examined, and the remaining four districts have not yet been re-examined. In the following table the results of the successive examinations of Kikwit, Bulungu and Kandale are given. [It should be noted that the diagnoses were based on gland palpation and not on microscopic examination.]

Comparative Table of Successive Examinations of the Territories of Kikwit, Bulungu and Kandale.

Villages.		Examinations.	Examinees.	Infected.	Per cent.	Treated.
Kikwit	...	1st	79,525	9,991	12·8	9,991
	...	2nd	87,587	8,731	9·9	14,066
	...	3rd	100,317	6,041	6	15,193
Bulungu	...	1st	80,250	9,763	12·2	9,763
	...	2nd	80,792	2,760	3·3	8,864
Kandale	...	1st	32,942	2,067	5·5	2,067
	...	2nd	40,143	372	1	1,782

The main points in this report have already been published elsewhere and have been summarized [this *Bulletin*, Vol. 15, p. 381 ; Vol. 19, p. 501 ; and Vol. 21, p. 371].

The report is illustrated by a number of excellent maps and by numerous tables setting forth the results of examination of the population in the various places in the eight districts.

W. Yorke.

i. LETONTURIER, DE MARQUEISSAC & JAMOT. **La prophylaxie de la maladie du sommeil au Cameroun dans les secteurs du Haut Nyong et de Doumé.**—*Ann. Inst. Pasteur.* 1924. Dec. Vol. 38. No. 12. pp. 1053–1100. With 7 figs. & 1 map. [2 refs.]

ii. ——, TANON & JAMOT. **La maladie du sommeil au Cameroun et sa prophylaxie.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6^{a}, 7^{a} e 8^{a} Sessões.) 1923. Aug. No. 4. pp. 143–147.

iii. LASNET. **La prophylaxie de la maladie du sommeil dans le Cameroun.**—*Bull. Office Internat. d' Hyg. Publique.* 1925. Mar. Vol. 17. No. 3. pp. 251–260.

i. The paper opens with a brief summary of the development of sleeping sickness work in the Cameroons from the discovery of the disease in Haut Nyong by STEIN in 1901, to March 1922, when Jamot took over from JOJOT the charge of the anti-sleeping sickness organization.

It is the object of the organization which has existed since this period to revisit the portions of the three sub-divisions which constitute the sector and to examine methodically one by one as great a number as possible of the inhabitants, thus making a census of the cases of trypanosomiasis, and finally to treat the infected at regular intervals. Diagnosis and treatment are based on microscopic examination under the direction of a doctor, and the patients are provided with a tally; the ultimate care of the patients is under the direction of Europeans, who visit the village periodically.

A number of pages are devoted to the diagnosis of sleeping sickness on a large scale. As previously mentioned, the authors base their diagnosis on microscopic observation. The triple centrifugation method of blood examination, which gives 92 per cent. of positive results, is evidently the most certain means of discovering the trypanosome, but is suitable only for the laboratory or hospital. The examination of fresh gland juice is, on the contrary, very easy and is the most practical procedure in the field. It is, however, not infallible and allows the escape of all patients whose glands are not puncturable and all those who have not lymphatic reactions and those who, even though the glands are puncturable, are negative. In order to obviate this difficulty the authors have supplemented the examination of gland juice by the examination of thick blood films. In 17,485 patients in whom trypanosomes have been sought on one occasion by these two methods of examination, the gland juice has been positive 13,807 times (79 per cent.) and the blood 11,712 times (66 per cent.); in 8,036 cases (45 per cent.) parasites have been found both in the gland juice and blood, and in 3,676 cases (21 per cent.) only in the blood. The authors conclude this section with a warning concerning the basing of diagnosis of sleeping sickness on gland palpation alone.

The next section deals with treatment. Commencing with atoxyl, the authors discuss briefly the various methods of administering this treatment, which has been adopted by the French during the last twenty years. JOJOT had endeavoured to inject 0·5 gm. of the drug every six days until the total of 7·5 gm. had been given. The treatment was then suspended and the patient examined after a month. In point of fact, most of the patients had been treated very irregularly, and this could hardly be otherwise. In 1921 JOJOT (this *Bulletin*, Vol. 19, p. 501) showed that atoxylization by the above method caused disappearance of the trypanosomes in 95 per cent. of the cases. The authors examined 2,033 of JOJOT's cases, which received during two years one to forty-eight injections of small doses of atoxyl, and found parasites in the blood of 739 (32 per cent.). The systematic atoxylization which, according to the authors, gives the best result from a prophylactic point of view, is an administration of massive doses repeated every fifteen days, every month, or even every two months.

After a short discussion on the question of associating other drugs with atoxyl, the authors pass on to "Bayer 205" and tryparsamide. "Bayer 205" was given to 35 patients in whom the disease was of eleven to twelve months' duration. Two or three injections, each of 1 gm., were given at 3 to 7 days' intervals. Of thirteen patients in whom the cerebro-spinal fluid was normal, nine were apparently cured, and four relapsed and were treated with atoxyl. All are in perfect health. Of twenty-two patients in whom the cerebrospinal fluid showed changes eleven are dead. Of the remainder six have relapsed. In none of the patients was there any improvement of the meningeal reactions. With regard to tryparsamide the authors state that they have received 250 gm. for trial, and that their results confirm entirely those of Miss PEARCE.

Other sections deal with the distribution of the disease in the Cameroons, with the question whether it is progressing or retrogressing, with the morbidity of the disease in each sex and at different ages, and with its evolution and prognosis.

The following are amongst the conclusions :—

> It is clear that sleeping sickness has obtained a firm footing in the Cameroons for many years in the regions of the Haut-Nyong and of Doumé.
>
> On account of the relative density of the population in these countries, the disease has shown itself exceptionally contagious, especially amongst the river tribes of Nyong.
>
> It has shown little tendency to retrogression, but in the south-west corner of the Doumé district it is apparently disappearing from a certain number of places where it has been endemic for ten years.
>
> Elsewhere the disease is spreading more or less actively in all directions. Although less virulent than in certain other regions of Equatorial Africa, it is an important factor in the death rate.
>
> The fundamental task of prophylactic service is to explore methodically village by village, and inhabitant by inhabitant, of the contaminated regions, or those merely suspected of being contaminated, and to determine with care the limits of the disease and thus the natural frontiers of the prophylactic sectors.
>
> One is thus able to supervise the movements of the natives from infected to uninfected areas by visiting as often as possible the zone bounding the contaminated and uncontaminated regions.
>
> Examination of the cerebrospinal fluid in nearly five hundred cases indicates that about half the patients are in the first stage of the disease and, consequently, can be cured, and therapy should therefore be directed not merely towards rendering the patients non-infective, but to curing all that are curable.

ii. This is practically a summary of the preceding paper.

iii. This paper gives a summary of the organization and functioning of the Service directed against Sleeping Sickness in the Cameroons. This region comprises the administrative subdivisions of Akonolinga, Abong-Mbang and Doumé, in which the population is 129,000. It deals with very much the same matter as the paper of LETONTURIER, de MARQUEISSAC and JAMOT.

W. Y.

VASSAL (J.). **La maladie du sommeil en Afrique Equatoriale Française. Résultats de tournées dans les Colonies du Moyen-Congo, de l'Oubangui-Chari, du Tchad et du Gabon.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 727–754.

In this paper the author summarizes the results of his observations on sleeping sickness in the districts of the Middle-Congo, of Oubangui-Chari, of Tchad and of Gabon.

He visited the Middle-Congo district on three occasions, viz., during December, 1922, to February, 1923, during November, 1923, and during June, 1921. The observations made during the first period have already been published [this *Bulletin*, Vol. 21, p. 746].

In 1923, 4,822 persons were examined and 92 (1·9 per cent.) found to be infected, and in 1924, 1,463 persons were examined and 19 (1·2 per cent.) new cases found. The 1923 cases were re-examined during the 1924 tour and only two were found to be dead. The author states that without doubt a period of 18 months is not long enough to permit of deciding the results of treatment, but he adds "What would have become of these patients without treatment ?" [This is a question concerning which it would be important to know the answer.]

The author made an extensive tour of almost 4,000 km. in Oubangui-Chari and Tchad with the object of inspecting the foci of sleeping sickness, the centres of greatest population, and the routes most frequented. Information is given regarding the amount of infection in the various villages and districts. Owing to the development of motor roads and the progress of its administration, Oubangui-Chari has been completely transformed and sleeping sickness work greatly simplified. Certain recommendations are made regarding future work. The Tchad sector is only partially contaminated in the south. It possesses an organization and the necessary means to prevent its invasion, and it is naturally protected on the north by the desert and by a climate which is unsuitable for tsetse.

Gabon was visited in June and July, 1924. The villages of the Bateke plateau were found to be free from infection, but 7 cases were found out of 258 persons examined in the villages between the Bateke plateau and Franceville. The last village enjoyed an evil reputation, and the proportion of cases of sleeping sickness has been variously estimated at between 10 and 40 per cent. of the population. The author found 5 per cent. infected among 237 persons in the Catholic Mission and 3 per cent. among 118 natives at the station ; but possibly the true figures are higher. At Lastourville, which is a much more important centre than Franceville, the author examined 751 persons and found 16 new cases and 54 old ones, giving a total of 70 (9·1 per cent.).

It is difficult to form a definite opinion regarding the position of sleeping sickness in Gabon, and the disease is very unequally distributed. The infantile mortality is great, and never more than two children per adult female were found. This relative sterility is a general phenomenon in French Equatorial Africa. Certain recommendations for dealing with the situation are made.

W. Y.

BLANCHARD (M.). & LEFROU (G.). **Résultats des plus récentes recherches faites à l'Institut Pasteur de Brazzaville sur le diagnostic, le prognostic, le traitement, et la prophylaxie de la maladie du sommeil.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 65–83.

In this paper, which is of a general nature, the authors deal with the question of diagnosis, prognosis, treatment and prophylaxis of sleeping sickness in the Belgian Congo. The paper does not lend itself to summarizing, and should be consulted in the original by those interested.

W. Y.

STEUDEL (F.). **Die "neue" Methode französischer Schlafkrankheitsbekämpfung.** [The "New" French Method of Sleeping Sickness Warfare.]—*Deut. Med. Woch.* 1925. Feb. 20. Vol. 51. No. 8. pp. 322–323.

This article is a criticism of the new French scheme for combating sleeping sickness, as outlined in "La Dépêche Coloniale et Maritime" of Oct. 10, 1924, the main point of which is, instead of merely seeking out the infected and rendering as many as possible temporarily non-infective, to make arrangements to render definite regions completely free from the disease and actually to cure the infected. The author states that the French have entered very late into the field campaign against sleeping sickness; formerly they contented themselves with laboratory studies at Brazzaville, and it is only about three years since they formulated definite plans for combating the disease in their equatorial Colonies. The sleeping sickness region was divided into 21 sectors, each of which was to be visited at least twice yearly by a doctor, assisted by 10 native hospital attendants, who would examine the population and inject the sick with atoxyl so as to render them non-infective to Glossina. Shortly after the introduction of this scheme papers appeared in the French press recording enormous numbers of examinations and injections.

The author asks why the French have suddenly dropped this highly praised method of atoxyl sterilization and changed to the method of treating the sick until they are cured. This "new" method was, in addition to clearing and other measures directed against Glossina, adopted by the Germans from the beginning and is also practised in English Colonies. It is suggested that the choice of the atoxyl sterilization method depended on the great disproportion between the small number of doctors available and the vast mass of sleeping sickness in the French Colonies. Further, such a scheme entails heavy loss amongst the medical staff, and the author pointed out that five French doctors died of the disease in about a year, and that in 1923 only 11 of the 21 sectors were supplied with a doctor and some of the 11 only for a part of the year. Steudel believes that this heavy loss of doctors is the essential reason of the change in policy. He points out, however, that for the "new" method far more doctors are necessary.

W. Y.

CORREIA (Alberto Carlos Germano da Silva). **A doença do sono em Angola.**—*Revista Méd. de Angola.* [No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 157–175. With 6 charts. [6 refs.]

After a statistical enumeration of the number of cases of sleeping sickness which have occurred in various' districts, notably Loanda, Dondo, Cabinda, Mossâmedes, and Benguela, month by month since 1873, there follows a brief résumé of the measures, from the administrative aspect, which have been put into force during the present century, and then suggestions for prophylaxis. The author states that he has nothing new to bring forward, but we notice that he mentions as one measure the destruction of the flies *en masse* by gas bombs dropped from aeroplanes.

H. Harold Scott.

DUKE (H. Lyndhurst). **Polymorphic Trypanosomes of the *T. brucei* Group recovered from the Mwanza Sleeping Sickness Area.**—*Ann. Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 415–435. [6 refs.]

The trypanosomes dealt with in this paper were obtained from the Mwanza Sleeping Sickness Area. The first two strains (human strain 483 and human strain "S") were obtained from human beings, and the third strain (wild fly strain "E") by feeding wild *G. swynnertoni* on a healthy monkey. Details of the passage of these three strains through a series of monkeys are shown in genealogical tables, from which the author concludes that it is clear that the three strains when first isolated were essentially identical in their behaviour in laboratory animals. No morphological differences were observed. All the strains were examined at intervals for posterior nuclear forms, which were found in each instance, though latterly not at every examination. An account is then given of transmission experiments carried out with laboratory bred *G. palpalis.* These experiments complete a series of three parallel studies on the effect of continued transmission of polymorphic trypanosomes of the *brucei* group. The strains examined are (1) the direct transmission strain isolated from wild Lake-shore *G. palpalis* in January, 1920; (2) the antelope strain isolated from a sitatunga antelope on Damba Island in September, 1920; and (3) the Mwanza human strain 483. All these strains when first isolated were readily infective for *G. palpalis.*

(1) *Direct Transmission Strain.*

After 11 direct passages, covering 16 months, this was still cyclically transmissible for tsetse, but after 23 more passages for a further period of 14 months the trypanosome was no longer able to develop in the tsetse. The exact period at which this change occurred was not determined, but the author believes that it coincided with the sudden increase in virulence which occurred about the 18th passage.

(2) *Antelope Strain.*

After 24 direct passages for a period of about 22 months this trypanosome had lost the power of invading the salivary glands of the fly. Heavy gut infections were, however, still obtainable. Ten months later, after 20 more passages, all power of development in the tsetse disappeared. The increase in virulence in the strain appeared about the 18th passage.

(3) *Mwanza Strain.*

After eight direct passages this strain had all but completely lost the power of development in tsetse. There had been no increase in virulence up to this point.

The author suggests that the fact that the Mwanza strain lost the power of cyclical development in tsetse much more rapidly than did the two Uganda strains can be explained on the assumption that whereas the Uganda strains were undoubtedly cyclically transmitted previously to their isolation in monkeys, there are reasons for believing that human strain 483 may have been subjected to a number of direct passages from man to man in the fly belt before reaching the native from whom it was isolated.

The last few pages of this important paper are concerned with a discussion of the above observations.

W. Y.

DUKE (H. Lyndhurst). **Trypanosomiasis Investigations.**—*Uganda Protectorate Ann. Rep. on the Bacteriological Dept. for the Year ended 31st December, 1924.* Part III. pp. 8–10.

In February, 1924, 3,455 wild *G. palpalis* caught in Damba Island were fed on healthy monkeys without any infection resulting; 1,163 wild flies were dissected and the proboscides examined to obtain the "game index," which proved to be 4·3. The blood of situtunga was inoculated into monkeys and the polymorphic trypanosome was recovered on one occasion. In September, 4,390 wild flies were fed on monkeys and one infection with the polymorphic trypanosome was obtained, the "game index" obtained from dissecting 1,511 flies proved to be 1·3 per cent. and the blood of three situtunga was inoculated into monkeys with negative results. As possibly the failure to recover trypanosomes from the many wild Damba flies was due to the inability of the organism to infect monkeys, four dogs were taken to Damba and each subjected to the bites of 1,500 flies, but no infection resulted.

Some 7,320 wild flies caught on the mainland near Entebbe were fed on clean monkeys, but no infection resulted. It is the author's intention to discuss these experiments with wild lake-shore flies more fully in a subsequent publication.

Reference is made to the inability of the Mwanza human strain to develop in Glossina after a number of direct passages through monkeys (*vide* previous summary).

The second part of the report deals with the reclamation of the shores and islands of Lake Victoria. The number of fishermen licensed during 1924 is 3,188, or 1,623 less than in the previous year. The population of the reclaimed area in the Buvuma Islands is 4,210, and in the Sesse Islands 6,531. Hitherto there has been no cause for apprehension about the success of the efforts made during the last five years to reclaim the fertile territory along the lake-shore. The indigenous polymorphic trypanosome still exists in the fly on Damba Island and no doubt elsewhere; but it seems probable that the reappearance of man has to some extent eliminated antelope from the fly's dietary in the re-populated area, and it may well be that the trypanosome, in the absence of mammalian hosts other than man, may die out in places where it flourished years ago. The fact that no cases of trypanosomiasis have been detected amongst the fishermen on the Islands lends additional support to the view that, at all events under carefully controlled conditions, cyclically carried parasites do not constitute a danger to the community.

The question of the introduction of human trypanosomes from adjoining infected areas is, however, much more pressing. Duke remarks on the present lack of uniformity for the control of human trypanosomiasis on the shores of Lake Victoria among the three Protectorates whose territories border on the Lake.

W. Y.

DUKE (H. Lyndhurst); LLOYD (Ll.) & JOHNSON (W. B.). **The Trypanosome Infections of Tsetse-Flies in Northern Nigeria and a New Method of Estimation.** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 142–144 [2 refs]; Oct. 23. No. 4. pp. 225–227 [2 refs.]

Duke commented on certain points raised in Lloyd and Johnson's paper on the trypanosome infections of tsetse flies in Northern Nigeria (this *Bulletin*, Vol. 21, p. 760). He raised the question of the presence of trypanosomes of the *gambiense-brucei* group in the labial cavity, and considered that the technique employed by Lloyd and Johnson (killing the flies by pressure on the thorax) affords a simple mechanical explanation of the presence of proventricular flagellates in the labium and that such forms have no developmental significance. Lloyd and Johnson agree that this is possible, but not likely, and think that the forms described by them were simply migrating forms travelling from the gut to the salivary glands. These authors consider that it is not safe to refer all trypanosome infections to their groups by inference from the location of the trypanosomes in the fly alone without some reference to their morphology.

The remainder of the correspondence is concerned with the relative merits of the methods of fly dissection adopted.

W. Y.

LLOYD (Ll.) & JOHNSON (W. B.). **Notes for Demonstration of Properties illustrating the Diagnostic Characters of the Flagellate Parasites of Tsetse-Flies.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 243–246. With 4 figs. on 2 plates.

At the Laboratory Meeting of the Royal Society of Tropical Medicine, the authors exhibited preparations illustrating the developmental stages of the various trypanosomes found in Glossina in Nigeria. An account of this work has already been published and noticed here (this *Bulletin*, Vol. 21, p. 760). The note is illustrated by two plates showing in a very clear manner the developmental stages of the various trypanosomes in Glossina.

W. Y.

GUILLET (R.). **A propos d'un suc ganglionnaire particulièrement riche en** *Trypanosoma gambiense*.—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 116–117. [5 refs.]

A native hospital patient, aged 45, was sent to the Dakar Pasteur Institute for microscopic examination for trypanosomiasis. Apart from some emaciation, sense of fatigue and lumbago, there were no symptoms, but it was noted that there was definite cervical adenitis.

On puncturing one of the glands, the juice showed "une véritable culture de trypanosomes"; in each microscopic field (oc. 4, obj. 7) 14 flagellates were counted. The author remarks that in his large experience he has never seen anything approaching this number of trypanosomes in gland juice.

W. Y.

KOPKE (Ayres). **Tratamento da doença do sôno.**—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6ª, 7ª e 8ª Sessões.) 1923. Aug. No. 4. pp. 51–61.

The author gives an interesting summary of the various stages through which the treatment of sleeping sickness has passed in his hands since 1901. At first he employed mercury, by mouth and by inunction, then arsenic, and, later, lysol intrathecally, and subsequent to this, atoxyl. He gives details of seven cases treated by the last-named since 1905, and concludes that when it is given hypodermically the results are good and cure effected if the trypanosomes have not invaded the central nervous system. When this has occurred neither atoxyl, 606, galyl, 914, nor tartar emetic averts the fatal issue. He has not had sufficient personal experience with "Bayer 205" to draw any definite conclusions as to its efficacy.

H. Harold Scott.

RODHAIN. **L'émétique et l'atoxyl dans le traitement de la trypanosomiase.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 185–187.

Rodhain addressed a circular letter to the Medical Officers of the Congo, in which he summarized what he regards as the main points in the treatment and prophylaxis of trypanosomiasis.

Treatment by atoxyl alone.

Patients in good condition and in the first stage of the disease generally tolerate well 1 gm. of atoxyl weekly. As a rule, the author has given an uninterrupted series of 12 to 19 of such weekly injections, and it is but rarely that it has been found necessary to stop the injections owing to ocular trouble. The number of injections can, however, without disadvantage, be reduced to 10. This is considered to be the most convenient method of prophylactic treatment, and it gives a proportion of permanent cures which have been estimated to be not less than 35 per cent. In patients especially sensitive to arsenic the weekly dose should be reduced to ·75 or ·8 gm. Patients in the second stage of the disease tolerate smaller doses, and it is advised in these cases that the dose should not exceed ·75 gm. As a routine treatment, a weekly dose of ·5 or ·6 gm. is best, and the majority of cases tolerate well such doses for an indefinite period, but treatment should be immediately suspended on the development of any visual trouble. On the whole, the author prefers subcutaneous or intramuscular injections to intravenous.

Treatment by emetic alone.

Weekly injections of ·1 gm. of emetic suffice to maintain peripheral sterilization, but they do not effect a cure even in recent cases. For this, 10 or more consecutive injections are necessary, and this is only practicable in hospitals. In the field the drug should be used only when visual disturbances have followed the administration of arsenic.

Treatment by emetic and atoxyl.

When it is possible to give two injections weekly, it is advantageous to combine atoxyl with emetic, patients in the first stage being given 1 gm. of atoxyl and ·1 gm. of emetic, and those in the second stage ·5 gm. of atoxyl and ·1 gm. of emetic. Such injections spaced at intervals of three or four days are well tolerated.

In conclusion, the author refers to another method of treatment, which consists in giving atoxyl ·5 gm. on the first day, emetic ·1 gm. on the second day, and atoxyl 1 gm. on the third day. This is advisable in the case of patients who are discovered on a first prophylactic tour, and who are not likely to be seen again for two or four weeks. It produces longer peripheral sterilization, and may in early cases lead to permanent cures.

W. Y.

MORGAN (Hugh J.). **A Case of Trypanosomiasis treated with Tryparsamide.**—*Amer. Jl. Med. Sciences.* 1924. June. Vol. 167. No. 6. pp. 827–835. With 1 chart. [10 refs.] And *Studies from the Rockefeller Inst. for Med. Res.* Reprints. Vol. 51. pp. 487–497.

The patient, a white woman aged 41, apparently contracted trypanosomiasis in the Belgian Congo in October, 1919. Trypanosomes (*T. gambiense*) were found in the blood, gland juice and cerebrospinal fluid in July, 1922. She was given three doses of atoxyl and, subsequently, 10 doses of "Bayer 205." In December, 1922, she was symptomless except for slight asthenia and anorexia. In June, 1923, a relapse occurred with well-marked nervous symptoms, but the blood, gland juice and cerebrospinal fluid were negative, although 30 cells per cmm. and globulin were found in the spinal fluid.

On March 20, 1923, tryparsamide 2 gm. was given intravenously with remarkably beneficial results; subsequently up to May 21, 9 further doses of tryparsamide were given, making 23·0 gm. in all. The improvement continued; on May 3rd the cerebrospinal fluid contained 20 cells per cmm., and a fair amount of globulin. The patient was discharged on May 24th, 1923, and returned for examination on July 5th. She had remained symptomless in the interval, and the cerebrospinal fluid showed on examination 12 cells per cmm., and some globulin.

W. Y.

CHESTERMAN (Clement C.). **The Therapeutic Effect of "Bayer 205" in Trypanosomiasis of the Central Nervous System.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 311–317. [7 refs.]

This paper embodies the results of research into the evidence of the degree in which "Bayer 205" reacts on the nervous system, which, the author states, in all probability is the *fons et origo* of a true relapse. It is obvious that information of this nature is essential before gauging the efficacy of a drug as a cure for trypanosomiasis. Information on this point is scanty and is briefly summarized. The author states that in his experience of over 600 cases, he has frequently noted that patients, who have received just enough of any drug to sterilize the blood, remain apparently fit for many months and then return, as a rule, much better than when they left, but examination of the cerebrospinal fluid reveals a marked and progressive meningeal reaction. Chesterman considers that the only safe and reliable guide to the patient's condition is the cell and albumen content of the cerebrospinal fluid. Details are given of 17 cases. All were well advanced in the second stage of the disease. The 9 cases comprising Series I had received previous treatment with arsenicals, etc., but the 8 in Series II had not. The routine treatment was the intravenous administration of 1 gm. of " Bayer 205 " repeated at weekly intervals. Examinations were made of the urine for the presence of albumen, but when it was realized that casts could always be detected by the microscope after centrifugation before the quantity of albumen was sufficient to be detected by trichloride acetic acid, this method was adopted. The author adds that had this been realized earlier, two cases would not have died of acute nephritis.

The records are not very encouraging. Two patients (Nos. 152 and 172) died of intercurrent bilharziasis and dysentery; two (Nos. 526 and 551) died of acute nephritis, and two (Nos. 164 and 483), who had suffered from amblyopia during their previous treatment with soamin, became completely blind after two injections of " Bayer 205." Eight patients (Nos. 170, 349, 422, 437, 552, 555, 557 and 564) returned in periods varying from six weeks to fifteen months and in a condition worse than when treatment was suspended. In four of these cases, this was confirmed by examination of the cerebrospinal fluid. In one of the cases (No. 552) the dose (3 gm.) was probably insufficient. One patient (No. 558), who remained with a cell count of 75 and ·02 per cent. of albumen in the cerebrospinal fluid, was treated with tryparsamide; after 12 gm. he was much improved, with 11 cells and ·01 per cent. of albumen in the cerebrospinal fluid, but the development of amblyopia precluded further doses.

The author remarks that possibly this early development of amblyopia was due to a diminished excretion of arsenic owing to damage to the kidneys by previous " Bayer 205." Finally, two cases (Nos. 468 and 550) were very much improved, but there has been no opportunity for re-examination, although there are reports that both are still alive four and five months respectively after treatment. The pathological findings in the cerebrospinal fluid after a course of " Bayer 205 " are summarized in a table, which, as the author says, is frankly disappointing.

W. Y.

HANINGTON (John). **Notes on the Treatment of Human Trypanosomiasis by " Bayer 205."**—*Nigeria Ann. Med. & San. Rep. for the Year 1923.* Appendix IV. pp. 42–45.

A summary is given of the results of treating 132 cases of trypanosomiasis at Sherifuri, Northern Nigeria. Most of the patients were of early middle age. The disease in the endemic area in question, which follows the Kiawa River from the Bauchi Hills to Sokwa, is not of the mild form usually associated with West Africa, but runs a rapidly fatal course; when it becomes established in a hamlet the population is decimated, and then the site is abandoned.

Details are given of a number of cases which were diagnosed early and then treated with " Bayer 205." So far as possible the subsequent history of all the cases has been followed, and in this the Political Officers of Hadeija and Katagum rendered every assistance; but keeping track of cases drawn from such a large and scattered area is extremely difficult.

Up to the end of July, 1924, 15 deaths have been recorded from the 132 cases seen; 4 of these received no " Bayer 205 "; 8 were brought into the camp in the last stage of the disease; one small boy decamped after his second injection and was reported to have died a month later from cerebrospinal meningitis; one patient who was brought to the camp in an advanced stage of the disease and received only a single injection apparently recovered, but died of what was presumably sleeping sickness nine months later; and the last case—a small girl—received three injections, returned to her village, and died of some unknown cause a month after the last injection.

The following statement summarizes the treatment given and the deaths recorded:—

18 cases received no " Bayer 205," and 4 died.
25 received 1 or 2 doses, and 6 died.
73 received 3 to 5 doses, and 2 died.
16 (whose sickness responded less readily to the drug), received from 6 to 10 doses, and 3 died.

The conclusion is:—

> Finally, from our experience, " Bayer 205 " appears to be the most efficient drug yet produced for African Sleeping Sickness. Although death has in some cases occurred in spite of it, there has been no case where very marked improvement did not follow its use. Its employment has produced no untoward results, except the transitory albuminuria. The brevity of its course is one of its great advantages, as no native will remain of his free will for a protracted treatment. The drug keeps well in the tropics, and its administration is exceedingly simple.*

W. Y.

LUENGO (E.). **Nuevas investigaciones en un caso mortal de tripanosomiasis humana tratado por el "Bayer 205."**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 203–209. [2 refs.]

The further history of an interesting case is described in which, in spite of the effect of " Bayer 205 " in causing the disappearance of trypanosomes from the blood time and again, the parasites reappeared and the patient eventually succumbed to the disease. Injections in doses of 1 gm. led to marked and rapid general improvement, but temporarily only. At the autopsy the only changes found were a limited degree of meningo-encephalitis, enlargement of the spleen and of the mediastinal and tracheo-bronchial lymphatic glands. The author is of opinion that this drug seems to modify the evolution of the trypanosome in such a way that instead of the disease progressing slowly it does so by intermittent exacerbations, and that actual cure of the disease and destruction of the trypanosomes are only possible when they have not yet succeeded in invading the nervous tissues.

H. Harold Scott.

NAUCK (E.). **Untersuchungen ueber die Wirkung des Trypanosomenheilmittels "Bayer 205."** [Investigations on the Action of " Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 1. pp. 1–16. [12 refs.]

With a view to obtaining some insight into the mode of action of " Bayer 205," the author performed a number of experiments from the results of which he draws the following conclusions:—

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* In these cases *G. tachinoides* seems to have been the carrier.—ED.

1. The mode of action of "Bayer 205" is to be regarded as a complicated process consisting of various factors.

2. In addition to a possible action on the whole organism of the treated animal, which leads to an alteration in the condition of existence for the parasite, thereby depriving it of a suitable medium, there is undoubtedly a direct action on the trypanosome cell.

3. Even short contact of the parasite-cells with "Bayer 205" in the test-tube, or in the peritoneal cavity of mice, or better still, in the peripheral blood of rabbits, damages the parasite so that even though they are not immediately killed, they have lost the power of reproduction, and become avirulent.

4. This direct damage takes place more quickly and intensely in the animal organism than in the test-tube.

5. "Bayer 205" is bound to the trypanosome cells and is not removed by prolonged sojourn in physiological saline or by frequent washings and centrifuging.

6. The drug is not stored up in the red corpuscles and is readily given up by these cells on washing in saline.

7. The direct activity of "Bayer 205" in the organism is superior to that of atoxyl or tartar-emetic.

W. Y.

COLLIER (W. A.). **Untersuchungen über die Festigung von Tsetse-trypanosomen gegen Bayer 205 und Arsenikalien.** [The Resistance of Tsetse-trypanosomes to "Bayer 205" and Arsenicals.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 26–31. [2 refs.]

The following are the conclusions :—

1. A resistance of nagana in mice against "Bayer 205" is possible within a short period.

2. Resistance against "Bayer 205" in mice which have been previously treated with large doses of arsenobenzol derivatives produces strains which are at the same time more or less resistant to arsenicals, antimony, triphenymethane dyes, azo dyes and acridin dyes.

3. Trypanosomes can also become resistant to arsenicals when they are maintained in mice which some time previously have been treated with large intravenous doses of arsenobenzol.

4. Since "Bayer 205" circulates for a long time in the blood, one must, in view of the above facts, consider the possibility that sooner or later a condition may arise in which, although the active substance is still present in the organism, its concentration does not suffice to kill off the developing trypanosomes. This is just as important for the employment of a drug as a prophylactic, as it is for the choice of doses in treatment.

W. Y.

LEUPOLD (Frida). **Gewinnung und Eigenschaften von "Bayer 205"-festen Trypanosomenstämmen.** [The Production and Properties of "Bayer 205" Resistant Strains.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 19–25.

The following summary is given :—

1. Drug resistance in trypanosomes which were originally highly sensitive to "Bayer 205" is easily obtainable if infected animals are treated with small doses and the relapse strains habituated to higher doses.

2. Trypanosomes resistant to arsenic, tartar emetic and trypaflavin are less highly influenced by "Bayer 205" than normal strains. They also become more quickly resistant to the drug than do normal strains.

3. Trypanosomes resistant to trypanblue are completely resistant to "Bayer 205."

4. A strain resistant to trypaflavin and arsenicals loses through resistance to "Bayer 205" its insensitiveness to arsacetin, and becomes even more sensitive to trypaflavin than before.

5. Treatment of nagana-infected animals with "Bayer 205" lessens the virulence of the acutely fatal strain and reduces it to a chronic infection with single well-separated paroxysms.

6. The rapidity with which resistance appears, and the tendency to a chronic relapsing course, permit a comparison with the action and the point of attack of di- and tri- phenylmethane dyes and with benzidin dyes.

W. Y.

PINTO (Cesar). **Doença de Chagas na Argentina.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 546–547.

The author comments on the paucity of cases of Chagas' disease in the Argentine recorded by previous observers, and cites a case of the cardiac form in a patient from whom 10 cc. of blood were taken and inoculated into a guineapig. Trypanosomes did not appear in the peripheral blood till 43 days later. It would seem, therefore, that cases are more frequent than is generally believed, since the results of inoculation experiments have been recorded as negative owing to the animals not having been examined for a sufficiently long period, or from comparatively refractory animals having been employed. Puppies, kittens, guineapigs and monkeys are more susceptible than rats.

H. Harold Scott.

VILLELA (Eurico) & BICALHO (Chagas). [In Portuguese & English.] **As pesquisas de laboratorio no diagnostico da Molestia de Chagas. Laboratory Tests in the Diagnosis of Chagas' Disease.**—*Mem. Inst. Oswaldo Cruz.* 1923. Vol. 16. No. 1. In Portuguese pp. 13–29. With 6 plates. [10 refs.] In English pp. 31–46.

In this paper the authors discuss the various means of diagnosing Chagas's disease. Dealing first with the examination of the blood, they mention direct examination of fresh and stained preparations and the triple centrifugation method. These methods are suitable for the acute form of the disease, but in the chronic cases the blood is generally negative. The inoculations of dogs, cats, marmosets and guineapigs are also useful in acute cases. Positive results were obtained by the inoculation of guineapigs in 26 per cent. of acute cases. Zenodiagnosis is not of much practical importance, not only on account of the time required, but also because the recent work of MAYER indicates the possibility of hereditary transmission of the parasites in the bugs. The authors then consider at some length the complement fixation test, and record a considerable number of observations from which the following conclusions are drawn :—

1. The complement fixation is the most practical and most sensitive of laboratory tests for the diagnosis of the chronic forms of Chagas' disease.

2. The antigen prepared with the aqueous extract of heart and spleen of infected animals (puppies) is strictly specific.

3. A mixed glycero-aqueous extract of heart and spleen offers the greatest number of advantages.

4. The value of the antigen appears to be proportionate to the parasitic infestation of the organ, so that it is advisable to make a previous examination of the organ used.

5. The aqueous extract of organs of animals (puppies) not infected with *Trypanosoma cruzi* does not furnish a complement-fixing antigen.

6. There is no correlation between the Wassermann reaction and a complement-fixation test in Chagas' disease: results of these tests are entirely independent.

7. The strict specificity of the test must be accepted with reserve as regards other trypanosomiases, on the one hand, and antigens prepared with other trypanosomes on the other.

W. Y.

VILLELA (Eurico). **Varação do poder pathogenico do "Tripanosoma cruzi" (raça neurotropica).**—*Sciencia Medica.* 1925. Feb. 28. Vol. 3. No. 2. pp. 147–148. With 1 fig.

The author obtained a strain of *T. cruzi* from an armadillo which had a greater virulence than the usual human strains, and this was raised still higher by passage through guineapigs and puppies. Inoculation into adult dogs produced staggering, convulsions and paralysis in 20-25 days, and death within six weeks. The trypanosome from a human source might take 30-40 days or more before any symptoms appeared, and, though by passage through guineapigs and young dogs this incubation period could be reduced, it never reached even half that of the armadillo strain.

Two dogs were inoculated on the same day with equal amounts of blood from guineapigs, one infected with a human and one with the armadillo strain. Twenty-nine days later that injected with the former was lively, though becoming thin, that with the latter was completely paralytic. Two others were similarly infected. Three weeks later the one infected with the human strain showed a little weakness and loss of weight, the other was definitely paralytic; both showed trypanosomes in the peripheral blood. The difference between the two strains was very marked, and that from the armadillo appeared to be particularly neurotropic.

H. Harold Scott.

ROSENTHAL (F.) & SPITZER (Fr.). **Weitere Untersuchungen ueber die trypanoziden Substanzen des menschlichen Serums. V. Mitteilung. Die Bedeutung des Retikuloendothels für den Mechanismus der trypanoziden Wirkung des Menschenserums.** [Further Investigation on the Trypanocidal Substances in Human Serum. The Significance of the Reticulo-Endothelium for the Mechanism of the Trypanocidal Activity of Human Serum.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1924. Aug. 12. Vol. 40. No. 6. pp. 529–551. With 1 chart in text. [13 refs.]

This interesting paper is a continuation of previous work by Rosenthal along the same lines, and deals with similar matter to one published elsewhere, and previously noticed here (this *Bulletin,* Vol. 22, p. 143).

The conclusions are :—

1. In aleucocyte animals [blood rendered free from leukocytes by treatment with Thorium X.] human serum exerts no trypanocidal action.

2. Iron blocking of the reticulo-endothelium alone is often sufficient to diminish considerably the trypanocidal effects of human serum. A definitely greater diminution is produced by extirpation of the spleen; whilst the combination of the two decreases the effect in a pronounced degree.

3. Experiments have shown that the macrophage system of the body plays a most important part in the mechanism of the trypanocidal action of human serum, and that the human serum which *in vitro* is inactive to trypanosomes is activated by the reticulo-endothelium system when introduced into the animal organism.

W. Y.

GRÜNMANDEL (S.) & LEICHTENTRITT (B.). **Der Gehalt des kindlichen Serums an trypanozider Substanz. Zweite Mitteilung. Untersuchungen bei Keratomalazie und ödematösen Zuständen. Dritte Mitteilung. Untersuchungen beim kindlichen Skorbut und den ihm verwandten Zuständen.** [The Content of Trypanocidal Substance in Children's Serum. Investigations in Ulceration of the Cornea and Oedematous Conditions and Infantile Scurvy.]—*Jahrbuch f. Kinderheilk.* 1924. July. Vol. 106. No. 4. pp. 203–214. [18 refs.]; pp. 215–226. [17 refs.]

I. Reference is made to a previous paper by LEICHTENTRITT and ZIELASKOWSKI in which it was shown that in a number of pathological conditions of young children the content of trypanocidal substances in the serum gives information concerning the defensive power of the organism (this *Bulletin*, Vol. 20, p. 337).

It has for some time been an axiom with the authors that in conditions which are dependent on a lack of vitamins the trypanocidal action of the serum is decreased or even absent.

Investigations were first made on children suffering from corneal ulcers, a disease which, in 1923, reached unprecedented proportions owing to the lack of high grade fats and the poor quality of milk. All the cases showed complete absence of trypanocidal substance. Even ·4 cc. of serum gave no protection when injected into experimentally-infected mice. The authors consider that there is probably no other disease in which the trypanocidal substance disappears so completely. The prognosis is correspondingly bad. Only one of the seven young children between eight weeks and fourteen months recovered, and in this case within a month of the onset of clinical improvement the serum had regained its trypanocidal activity. A similar result was obtained in the case of two older children.

In children suffering from alimentary oedema due to improper dietary and complicated by secondary infections similar observations were made.

II. The authors draw attention to the great strides that have been made during recent years in knowledge of the pathogenesis of infantile scurvy. MEYER has postulated a scurvy diathesis and with this the authors agree. They point out that the great majority of children suffering from Barlow's disease are constitutionally defective. Dietary and various infections are, of course, important, but the essential predisposing cause is constitutional.

Certain infections are known to be instrumental in precipitating Barlow's disease, e.g., dysentery and whooping cough. Blood can often be found in the stools of children suffering from scurvy, and

Ratnoff has found blood in 75 per cent. of his cases of icterus neonatorum. Ratnoff traces a parallel between this disease and scurvy, and assumes that in both the arterial reticulo-endothelium is undeveloped. The authors reached the same conclusions during their investigations into the trypanocidal substance of the serum of children.

The authors discuss a number of conditions in which diagnosis is difficult, and the opinion is expressed that examination of the trypanocidal activities of the serum may be useful in these cases.

W. Y.

Dukelsky (Olga). **Ueber die Neutralisierung des Anaphylatoxins durch Salvarsan in Verbindung mit der Pathogenese der Todesfälle bei Trypanosomenerkrankungen.** [On the Neutralization of Anaphylatoxin by Salvarsan in Relation to the Pathogenesis of Fatal Cases in Trypanosomal Disease.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. Feb. 16. Vol. 42. No. 2. pp. 113–122. [13 refs.]

Experiments with infected mice have shown that the injection of salvarsan usually results in cure even when the animals are in a very advanced stage, with parasites about as numerous as the erythrocytes. On the contrary, similar experiments with other trypanocidal bodies, e.g., "Bayer 205," have given quite different results: when this drug is given at a time that the blood contains very numerous parasites death occurs in a few hours, although the number of parasites has decreased. To explain this difference, it is necessary to have some insight into the factors which lead to death in this disease. Various theories have been advanced, but these are not very satisfactory, and the author believes that the whole symptom-complex resembles very closely anaphylactic shock, which could in this case be explained by the action of an anaphylatoxin formed by tho trypanosomes in the blood. A considerable number of experiments are recorded, from which the author draws the following conclusions :—

1. Attempts to neutralize the anaphylatoxin *in vitro* by means of salvarsan lead mostly to positive results.
2. The clinical symptom-complex and the quick occurrence of death in acute trypanosomiasis recall an anaphylactic shock. This circumstance and the rapid improvement of the animal after salvarsan administration permit the conclusion that the anaphylatoxin formed by the action of the trypanosomes which cause the symptoms and death is neutralized *in vivo* by salvarsan in a manner similar to that which takes place *in vitro.*
3. The power of salvarsan to neutralize anaphylatoxin is dependent on its high physico-chemical activity.

W. Y.

Morrison (Henry). **The Serum-Formalin Reaction in Human Trypanosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 214–216. [3 refs.]

The serum-formalin reaction was examined in a series of 20 patients of whom 10 suffered from trypanosomiasis and the remainder from other diseases, e.g., dysentery, malaria, smallpox, relapsing fever. The results are summarized in a table. The reaction was positive in 6 hours in nine cases of trypanosomiasis, in the remaining case after 48 hours. Of the 10 other cases one was positive after 6 and three after 24 hours.

The author concludes (1) that the percentage of positives among the cases other than trypanosomiasis is too high to admit of a definite diagnostic value being placed on the reaction, (2) that these natives who had always resided in the area might have suffered from trypanosomiasis and recovered, (3) that the treatment by Bayer 205, which all the trypanosomiasis cases underwent, may have influenced the reaction. Seeing that the test was positive in three apparently cured trypanosomiasis cases he wonders whether or not after definitive cure it becomes negative.

W. Y.

BATTAGLIA (Mario). **Ueber Infektion mit einigen menschlichen und tierischen Protozoen.** [Infection with some Human and Animal Protozoa.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Oct. 15. Vol. 92. No. 7/8. pp. 540–542. [15 refs.]

As the result of a series of experiments on small and medium sized animals infected with various trypanosomes, e.g., *T. lewisi*, *T. brucei*, *T. dromedarii*, *T. gambiense* and *T. vespertilionis*, the author concludes that the trypanosomes begin their development in an amoeboid sporephase, and that atoxyl does not cure trypanosomiasis because it only acts on the flagellate forms leaving the spores and amoeboid forms intact.

W. Y.

i. TANON (L. & JAMOT (E.). **Valeur du B.205 dans le traitement de la trypanosomiase humaine au Cameroun.**—*Bull. Acad. Méd.* 1925. Apr. 14. Year 89. 3rd Ser. Vol. 93. No. 15. pp. 394–397.

ii. VAN HOOF (L.). **Thérapeutique de la maladie du sommeil et des trypanosomiases animales africaines.**—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a, e 8a Sessões.) 1923. Aug. No. 4. pp. 87–128. With 2 plates. [104 refs.]

iii. LEJEUNE (E.). **La prophylaxie de la maladie du sommeil.—Son organisation au Congo Belge.**—*Ibid.* pp. 177–229. [13 refs.]

iv. KOLLE (W.). **Ueber den chemotherapeutischen Wirkungsvorgang und die Arzneifestigkeit bei Bayer 205 und anderen chemischen Stoffen.** [The Mechanism of the Chemotherapeutic Action of Drug Resistance in Bayer 205 and Other Chemical Bodies.]—*Arb. a. d. Staatsinstitut f. Experim. Therap. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1924. No. 17. pp. 3–18. [1 ref.]

i. This paper is similar to one previously published elsewhere and already noticed [this *Bulletin*, Vol. 22, p. 136].

ii. In this paper, which is of a general nature, the author discusses briefly the value of a very large number of drugs which have hitherto been used in the treatment of trypanosomiasis.

iii. The author gives a description of the anti-sleeping sickness organization which has been set up in the Belgian Congo; it should be consulted in the original by those interested.

iv. A paper of a technical nature which should be consulted by those who are interested in the original.

W. Y.

FISCHER (W.). **Die afrikanische Schlafkrankheit (Trypanosomiasis hum.) und ihre Bekämpfung unter besonderer Berücksichtigung der Deutschen Schlafkrankheits-expedition 1921-24.**—*Muench. Med. Woch.* 1925. Apr. 24. Vol. 72. No. 17. pp. 684–687.

TANON & JAMOT. **La maladie du sommeil au Congrès de Loanda.**—*Ann. d'Hyg. Publique, Industrielle et Sociale.* 1924. Feb. Vol. 2. New Ser. No. 2. pp. 107–113.

REVIEW OF PELLAGRA LITERATURE.—II.*

During the last two or three years the volume of literature dealing with pellagra has diminished considerably. Coincident with this, apparently, there has been a decrease in the number of cases reported. The reasons for these facts are not far to seek. During the Great War and the period immediately following it two unusual factors were in operation: (1) A collecting together of individuals into large groups in a highly artificial manner, so that in many of these bad feeding, overcrowding, and diseases of various kinds were only too prevalent; (2) The presence in various parts of the world, previously unknown to them, of numerous medical officers anxious to make the war years medically interesting by the study of the fresh clinical pictures presented to them. The harvest, indeed, was plenteous, and the labourers eager and well trained. Nevertheless, even with the disappearance of the above factors, cases in new areas and new cases in old areas have been reported, and with these the first section of the present review deals.

Pellagra is unknown, or at any rate extremely rare, on the Gold Coast. A case is reported by COOKE[1] of a male convict, aet. 30, in the prison at Accra The man had been incarcerated for nine months, and no other cases were noted. The author does not attempt an etiological explanation.

Eight, more or less typical, cases are reported from the University Clinic of Tokyo by ITO.[2] Here, too, no adequate etiological factors are given in the histories, but the fact that three of the cases had been, or actually were, suffering from beriberi suggests some defect in diet. From Kenya Colony comes a record of a case published by NAIR.[3] The patient, a native aged 35, suffered from three attacks of a pellagra-like rash accompanied by soreness of the tongue. No further details are given, so that the author must be left in the condition revealed by the last sentence of his note: "Now I wonder what the patient is suffering from if it is not pellagra." HEAD[4] claims that the case reported by him is the first recorded in South Dakota. A woman, aged 50, owing to dental trouble, had eaten no meat for two years, and had lived upon "soft mushy foods." From the clinical description, illustrated by beautiful coloured plates, there can be little doubt that the case was one of true pellagra. This diagnosis was confirmed by Dr. GOLDBERGER.

As regards the incidence of pellagra in asylum practice it would appear that in many institutions the disease must be overlooked, since in some it is practically endemic. More particularly is this true of the Lancashire County Mental Hospital at Rainhill, where WATSON[5] reports two new cases, thus bringing the total number of cases here recorded since 1913 up to 53. Both cases proved fatal in a few weeks. The workers in this hospital are convinced that no food deficiency can account for the condition. At Cane Hill Mental Hospital, McCOWAN[6] records four cases during the last two years. These, however, are regarded as being essentially dietetic in origin, all of them having been improperly nourished previously owing to their refusal to take sufficient food.

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* For the first of this series see Vol. 21, pp. 523-526.

[1] **COOKE** (Francis H.). A Short Report on a Case of Pellagra in the Convict Prison, Accra, Gold Coast.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. p. 219.

[2] **ITO** (M.). Ueber Pellagra, resp. Pellagroid in Japan und ihre Behandlung mit Reiskleienextrakt. [Abstract.]—*Japan Jl. Dermat. & Urol.* 1924. Mar. Vol. 24. No. 3. pp. 21–29. [In Japanese pp. 240–302. With 32 figs. 110 refs.]

[3] **NAIR** (T. D.). A Probable Case of Pellagra.—*Kenya Med. Jl.* 1924. Apr. Vol. 1. No. 1. pp. 20–21.

[4] **HEAD** (George Douglas). A Case of Pellagra—its Bearing on the Etiology and Cure of the Disease.—*Arch. Intern. Med.* 1924. July 15. Vol. 34. No. 1. pp. 93–96. With 5 text figs. [9 refs.]

[5] **WATSON** (G. A.). Pellagra.—*Tenth Ann. Rep. Board of Control for* 1923. *Lunacy & Mental Deficiency.* p. 81. 1924. H.M. Stationery Office.

The mystery of pellagra etiology, instead of becoming clearer, seems more baffling than ever, for more evidence is coming to light, tending to disprove the dietetic deficiency theory. Even the strongest supporters of this view do not help matters by constantly changing their ground concerning the substance or substances the absence of which brings about the disease. Thus GOLDBERGER and TANNER,[7] having forsaken their recent amino-acid love, promptly turn their attention towards a still newer mistress, called by them "pellagra-preventing factor." In the conclusions to their latest paper the following are quoted :—

"(1) In the prevention (and presumably causation) of pellagra there is concerned a heretofore unrecognized or unappreciated dietary factor which we designate as factor P—P. *This may be effective with but little, possibly without any, co-operation from the protein factor.* [The italics are the reviewer's.] (2) Factor P—P may possibly play the sole essential role in the prevention (and causation) of pellagra. (3) Factor P—P is present in brewers' yeast, in milk and in lean beef; it is very low or lacking in dry Soy beans, dry cow peas, butter, cod-liver oil and canned tomatoes."

This P—P factor must, apparently, be regarded as a vitamin, and in this connexion it will be interesting to discuss shortly the work of other observers who regard pellagra as a manifestation of avitaminosis. Seale HARRIS,[8] though regarding diet as important in etiology, states that this is so only in so far as food deficiency, especially with low vitamin C content and carbo-hydrate excess, lowers bodily resistance. ITO[9] and OWENSBY,[10] on the other hand, regard vitamin B deficiency as the causal factor with the addition of, according to the latter observer, vitamin C deficiency as a contributory factor.

In contradistinction to the above we have WHEELER[11] taking up the old protein deficiency theory. He points out that those whose diet is upon the borderline of deficiency run the risk of contracting pellagra because any slight alteration in food, or even in mode of life, may suddenly render the diet insufficient. The paper in which this view is expressed deals with the variation in one item of food, viz., milk, and its connexion with pellagra in the household. Three family cases are described in which, with the addition of milk, the diet was just safe, but with the withdrawal of this commodity, for one reason or another, pellagra developed. It is interesting to note that the interval elapsing between the beginning of the diet defect and the appearance of symptoms of the disease was in every case three to three and a-half months.

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[6] McCOWAN (P. K.). Pellagra: a Report of Four Cases with Histological Findings in One Case.—*Jl. Mental Science.* 1924. July. Vol. 70. No. 290. pp. 410–422. [12 refs.]

[7] GOLDBERGER (Joseph) & TANNER (W. F.). A Study of the Pellagra-Preventive Action of Dried Beans, Casein, Dried Milk, and Brewers' Yeast, with a Consideration of the Essential Preventive Factors Involved.—*Public Health Rep.* 1925. Jan. 9. Vol. 40. No. 2. pp. 54–80. [11 refs.]

[8] HARRIS (Seale). The Food Factor in Pellagra.—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 709–719. [12 refs.] [United Fruit Company, Boston, Mass.]

[9] ITO (Minoru). [On Pellagra, or Pellagroid in Japan.]—*Hifuka Hitsunyokika Zasshi* (*Jl. Dermat. & Urol.*). 1924. Mar. Vol. 24. No. 3. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 269.]

[10] OWENSBY (Newdigate M.). Pellagra.—*Med. Jl. & Record.* New York 1924. Oct. 15. pp. 377–379. [8 refs.]

[11] WHEELER (G. A.). Pellagra in Relation to Milk Supply in the Household.—*Public Health Rep.* 1924. Aug. 29. Vol. 39. No. 35. pp. 2197–2199.

In the opinion of the reviewer one of the strongest arguments against the food deficiency causation of pellagra is the great rarity of the disease in general hospitals, where there are always a few cases being slowly starved to death as the result of disease. Ever since the war one has particularly observed such cases, but so far with negative results. The paper of BENDER[12] is of particular interest in this respect. He, too, remarks upon the paucity of cases of pellagra associated with organic defects of the stomach, etc. In the literature he was only able to find two such cases: (1) Quoted by ROLPH, in which a woman, suffering from dysphagia and vomiting for seven months as a result of carcinoma ventriculi, four months before her death developed pellagra; (2) A case quoted by BRYAN, in which symptoms of peptic ulcer had been present for 20 years with increasing vomiting so that during the last four months very little food had been retained. At operation a gastric carcinoma was discovered and a gastro-enterostomy performed. As a result the symptoms were relieved, and in two months the pellagra manifestations also had disappeared. To these cases BENDER adds three of his own. In the first pellagra developed "during a period of jejunal feeding necessitated by deformity of the stomach by a benign ulcer." Cure of the ulcer resulted in the disappearance of pellagra. The remaining two cases were due to progressive carcinomatous destruction of the stomach. GOLDBERGER and TANNER are quoted as having had a case similar to No. 1 in this author's series.

In the recent literature two more cases of somewhat similar etiology are recounted. Thus, CORLETTE[13] had under his care in Australia a patient who for some time had been suffering from hydatid disease of the liver. Later, an abscess formed in the liver which penetrated the lung, giving rise to septic symptoms and emaciation. A fairly typical mild pellagra developed, probably as a result of the cachexia. Great improvement followed the draining of the liver abscess. LANZARINI[14] describes a case associated with multilobular cirrhosis of the liver.

Before turning to the purely pathological section of the review, mention must be made of the work of WATSON[15] and the bearing of his pathological researches on the question of pellagra etiology. This observer is in the almost unique position of being a world famous expert upon cerebral pathology and having at the same time a thorough knowledge of pellagra both clinically and pathologically. Naturally, he views the subject from a different angle from most other workers, and he attempts to deduce the etiological factors of the disease chiefly from the pathological appearances met with in the central nervous system. It is generally agreed that the typical change in this region is a condition called by Adolf MEYER in 1901 Central Neuritis. Here the nerve cells show chromatolysis, excentricity of the nucleus, etc., the result of a degeneration of an axonal type, i.e., one resembling the appearance of a nerve cell when its axone is damaged peripherally. It is important to realize that this change is a degenerative one, and in no respect of an inflammatory nature. In pellagra this central neuritis shows itself particularly in certain cells of the cortical layers, i.e., in the larger cells, and to a less degree in the anterior cornual cells of the cord, and in the cells of Clarke's column. Granted, then, that central neuritis is the typical nervous lesion in pellagra, does this fact throw light upon the etiology of the disease ? WATSON is of the opinion that the answer is certainly in the affirmative since the nature of the lesion and its cortical distribution is definitely against any inflammatory basis or protozoal origin.

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[12] BENDER (William L.). Pellegra Secondary to Lesions of the Stomach interfering with Nutrition.—*Jl. Amer. Med. Assoc.* 1925. Apr. 25. Vol. 84. No. 17. pp. 1250–1252. With 1 text fig. [9 refs.]

[13] CORLETTE (C. E.). On Pellagra: with an Account of a Case.—*Med. Jl. Australia.* 1924. June 21. 11th Year. Vol. 1. No. 25. pp. 613–617.

[14] LANZARINI (Felice). Considerazioni cliniche sopra un caso di cirrosi epatica pellagrosa senza ascite.—*Gaz. d. Ospedali e d. Cliniche.* 1924. May 18. Vol. 45. No. 20. pp. 462–466.

[15] WATSON (G. A.). Personal communication.

"In explanation of the liability of certain sets of neurones to be especially involved in pellagra (and the same applies to central neuritis) it seems necessary to assume that in patients who suffer from these conditions there is an inherent instability in such neurones which renders them the more readily liable to be affected by metabolic disturbances, and these are just the neurones, on account of their size, in which metabolic exchanges are most difficult." Such metabolic disturbance is probably associated with lack of endocrine balance since "both central neuritis and pellagra occur in the majority of mental hospital cases somewhere about the climacteric, when endocrine disturbance is apt to occur, presumably of gonad origin, and more common in females. The minority cases are nearly all, if not all, cases of dementia praecox in which there is certainly often, and probably always, very definite evidence of endocrine imbalance."

That there is an association between central neuritis and pellagra is a fact ; that the cause of both is an endogenous toxin acting through the agency of the endocrine system upon neurones of inherent instability is certainly a possibility. One has only to consider the clinical appearances which would be presented by a case of Addison's disease associated with central neuritis to grasp the significance of WATSON'S theory.

Turning now to the purely pathological side of our subject perhaps the most interesting paper is that by PIERCE.[16] This worker carried out exhaustive post-mortem studies, particularly on the nervous system, on a female pellagrin whose case was not complicated by the presence of any other psychosis. In addition to central neuritis affecting most of the Betz cells, less noticeably the large pyramidal cells in the inner cortical layer and not at all the Purkinje cells of the cerebellum, there was marked cortical gliosis. A discussion followed the reading of this paper, in which Dr. Adolf MEYER took part. In his remarks he stated that all the cases of central neuritis he could remember had a tendency to refuse food and had to be fed by a spoon or tube. Dr. GREGORY gave it as his opinion that in the Northern States of America, or at any rate in his own cases, the initial picture was one of central neuritis followed later by dermatitis and intestinal symptoms, while in the South, apparently, central neuritis was regarded as a terminal event in pellagra.

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[16] PIERCE (Lydia B.). Pellagra. Report of a Case.—*Amer. Jl. Psychiatry.* 1924. Oct. Vol. 4. (Old ser. Vol. 81.) No. 2. pp. 237–240. With 6 figs. [5 refs.]

DENTON[17] gives an account of interesting post-mortem results obtained in 12 cases located in the Panama Zone. The value of the findings is enhanced by the fact that in no case was death due to intercurrent affection. He regards the following features as diagnostic of pellagra at autopsy, viz.: (a) A brownish red colouration of the buccal and oesophageal mucous membranes, with or without small necrotic areas. This colour is due to telangiectases covered by a thin layer of epithelium; (b) a similar brownish red colouration of the small intestine; and (c) a colitis of peculiar degree and intensity. The changes in the nerve cells this author regards as being of the nature of a " by-product of the disease."

McCOWAN[6] reports upon three post-mortem cases occurring in asylum practice. His findings are in agreement with those of other observers.

The mechanism of the pigmentation in pellagra provides a constant source of discussion. When it is remembered that 50 per cent. of maize protein is zein, which is deficient in tryptophane and lysine, and that aromatic amino-acids absorb ultra-violet rays, the idea of DAWBARN[18] that when the diet lacks tryptophane this substance, not being found in the superficial layers of the skin, would allow the rays to attack the deeper layers, is certainly ingenious. However, experiments carried out with white mice to test this hypothesis gave a negative result.

As might be expected, the section of this review dealing with therapeutic measures is, as formerly, the least satisfactory. GOLDBERGER and TANNER,[7] realizing that their former pellagra-preventing diet was probably in excess of the minimum required, and was at the same time expensive, sought for substitutes. Soy beans, cow peas, casein and dried milk were found unsatisfactory. Brewers' yeast, however, was found extremely efficacious. This was given in the form of dry powder made by the Harris Laboratories, Tuckahoe, N.Y. The amount given to pellagrins with active symptoms was 50 gms. daily, reduced to 15 gms. when convalescence was established. This smaller dose was given also to milder active cases, and to those without any symptoms at all. Later it was found that 30 gms. was safer as a daily ration, and with less than this relapses occurred.

ITO[2] treated his Japanese pellagrins with rice husk administered in one of two forms: (*a*) Watery extract of rice husk 50 cc. per diem by mouth; and (*b*) oryzanin (a preparation of rice husk) in doses of 3–4·5 gms. a day. Apparently the treatment was most successful.

" A full diet, rich in vitamins, particularly B and C, with a low carbohydrate content, eliminating cane sugar entirely, is essential in the treatment of pellagra." (Seale HARRIS.[8])

In conclusion, it must be admitted that pellagra in etiology, in mechanism of symptom production, and in treatment, remains a mystery as inviolate as the cause of cancer, and as baffling as the nature of life itself.

A. Douglas Bigland.

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[17] DENTON (James). The Pathology of Pellagra.—*Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 173–210. With 14 text figs. [5 refs.]

[18] DAWBARN (M. C.). The Negative Result of an Attempt to sensitize White Mice to the Action of Ultra-Violet Light by a Diet Deficient in Tryptophane.—*Australian Jl. Experim. Biol. & Med. Sci.* 1924. Sept. 15. Vol. 1. Pt. 3. pp. 73–75. [2 refs.].

YAWS.

RAMSAY (G. C.). **The Influence of Climate and Malaria on Yaws.**—*Jl. Trop. Med. & Hyg.* 1925. Feb. 16. Vol. 28. No. 4. pp. 85–86. [6 refs.]

In this paper Dr. Ramsay, writing from the Labac Central Hospital, Cachar, Assam, relates a number of interesting observations on yaws. He finds that the disease is commoner among those tribes which inhabit the mountainous regions (2,000–6,000 ft.) of the province than among the dwellers on the plain, and quotes Captain CANTLIE, who describes cases as common in the high country around Torit (1,000 [illegible] ft.) in Mongalla in contradistinction to CASTELLANI and CHAMBERS who, it is said, state that the disease is not found above 800 ft. [That yaws is found at the higher altitudes is, of course, well known, *vide* SELLARDS, *Philippine Jl. Sci.* 1923. Vol. 22. No. 3; WENCKEL, *Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3; Reports from Kenya and Tanganyika Territory.]

The second observation is to the effect that the disease as seen in the plains in the warm weather is that described in text-books in the primary and secondary stages—widespread papular eruptions, furfuraceous desquamation, "framboesial" lesions and circinate forms, but that in the cold season these are rarely seen, while condyloma-like lesions in the warm, moist regions of the axilla and between the nates are found together with a chronic dermatitis of the hands and the worm-eaten appearance on the soles of the feet. With the return of the warm weather the florid eruption may reappear. The disease as seen in the hills approximates to the cold weather type of the plains, but an infected native coming down from the hills to the plains develops in the warm weather typical florid yaws. [These observations confirm those of SELLARDS.] Discussing later stages of the disease Dr. Ramsay states that in an experience of over 1,000 cases of yaws tertiary lesions, with exception of the lesions on the hands and feet above mentioned, are uncommon. Arthritis occurs in 3 per cent., chiefly of the phalanges. Six cases of periostitis were met with. Juxta-articular nodules were seen in two patients giving a history of yaws. Gangosa, goundou and cases of "neuroframboesia" were not seen.

Tertiary lesions appear to occur more frequently among the hill peoples than those on the plains and the author believes that this difference is accounted for by some effect which malaria has upon the disease among the plain dwellers. He believes that the mild cases of syphilis without tertiary lesions seen in the same district are similarly accounted for. This belief he bases on POWELL's observation that yaws eruptions often retrogress and disappear if the patient suffer some febrile disturbance, malarial or otherwise. Dr. Ramsay says, "it would seem a feasible conclusion that the prevalence and severity of tertiary framboesial lesions depends upon the absence, incidence and degree of malarial infection in a yaw-infected region." [That the eruptions of many skin diseases will disappear as the result of a febrile attack is well known, but is there any proof that under similar conditions a case of yaws is cured?] As the matter stands at present it is little more than an interesting speculation, but one upon which more extended observations by Dr. Ramsay and workers in other countries may throw further light.

H. S. Stannus.

BORY (Louis). **Le pian, affection parasyphilitique ou syphilis primitive.** —*Progrès Méd.* 1924. June 28. No. 26. pp. 393–395. With 2 text figs. [2 refs.]

The author, who is apparently a disciple of the school which believes that yaws and syphilis are one and the same disease, goes over the old ground of the multiple resemblances of the two diseases without bringing forth any new evidence in favour of this thesis. He believes that yaws is the more primitive type of disease, one that has remained dermotropic in its manifestations under its primitive conditions among native races in tropical countries, but that since the beginning of the era of colonization coincident with Columbus' voyages the disease spread among Europeans under different conditions and developed into syphilis as we know it, the virus in the earlier centuries being still dermotropic but later becoming more and more neurotropic. He looks upon yaws as primitive syphilis, and suggests that the term "parasyphilis" should include yaws of the present day and syphilitic affections caused by the neurotropic virus in cool countries. [This is a suggestion which would seem to have little to commend it and one which does not make for any simplification of the problem. One might with good reason say "why not call syphilis paraframboesia"?]

The author tends to argue from similarities [everyone knows these points of similarity] rather to the exclusion of the specific differences between the two diseases. [The fact that mucous membranes are rarely if ever the seat of lesions in yaws is surely of greater importance than that the mucous plaques seen, say, between the nates in both syphilis and yaws are difficult or impossible to differentiate from one another, just as two skin diseases which have become eczematized may be difficult to differentiate.]

Dr. Bory denies any morphological differences between the two spirochaetes and sees in the results of cross-immunization experiments only evidence of there being perhaps as much difference between the races of yaws spirochaetes and syphilis spirochaetes as between the virus of neurotropic and dermotropic syphilis, beliefs that would not be held by many observers; also many authorities deny the separate existence of neurotropic and dermotropic viruses in syphilis. The whole problem is an interesting one and calls for further investigation, but Dr. Bory has, the reviewer feels, done very little to help its elucidation.

H. S. S.

GUTIERREZ (Perpetuo D.). **The Importance of the Tertiary Manifestations of Yaws.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 568-577. With 9 figs. [27 refs.]

The study of 229 cases of yaws at Paranaque (Philippines) revealed tertiary lesions in a third of the patients. Cases with primary lesion 10; secondary 90; tertiary 24; secondary plus tertiary 39; primary, secondary and tertiary 14. The tertiary manifestations noted were periostitis in 7 cases; gummata in 3; keratosis in 10; combined lesions in 3. The author then gives a fairly precise description of these tertiary clinical manifestations as observed by himself, but classes together as a single pathological entity keratosis palmaris et plantaris, peculiar pitting of the hands, foot yaws and melung, a point upon which many observers would not agree. He also wrongly ascribes the description of melung to CASTELLANI and CHAL[illegible] as the term was first used by ZIEMANN for a condition, observed by him in West Africa and at about the same time by the reviewer in East Africa, believed to be a form of leucoderma. Later, the condition characterized by pigmentary changes affecting the skin of the hands, wrists, feet and ankles was believed to be due to yaws. The author considers that gangosa and juxta-articular nodules (cases not included in the series above) are also manifestations of yaws, but he brings forward no pathological evidence. The photographs are good, but represent ordinary typical cases, and there is nothing new in the subject matter of the paper. [See also this *Bulletin*, Vol. 20, p. 175.]

H. S. S.

ANDRUZZI (Alcibiade). **La framboesia tropica nella Somalia Italiana.**—*Ann. di Med. Nav. e Colon.* 1924. Nov.-Dec. Year 30. Vol. 2. No. 5-6. pp. 385-389.

Major Andruzzi, of the Italian Naval Medical Service, in the course of investigations regarding the incidence of plague in Italian Somaliland, came across a number of the inhabitants suffering from skin and bone lesions which he first attributed to syphilis. Later, he saw cases of undoubted yaws, and subsequently, among those who applied to the travelling ambulance for treatment for syphilis, was able from the clinical history and manifestations to pick out a number of cases of yaws in all its stages.

H. S. S.

CADY (Lee D.) & ENGMAN (Martin F.). **A Case of Yaws occurring in Missouri.**—*Arch. Dermat. & Syph.* 1924. Oct. Vol. 10. No. 4. pp. 446-452. With 4 figs. [4 refs.]

The authors here report a case which they believe to be yaws in a coloured man, aged 27, whose life had been spent in Tennessee and Missouri, the disease having been contracted, they suggest, from his mistress, or from hides with which he was in contact during his work for two years. [No evidence is adduced to inculpate the hides, and the only fact mentioned about the mistress is that her blood serum gave a complete positive Wassermann reaction.] The initial lesion consisted of small nodules in front of the ear like warts, which became covered with white scales, and later fungated and ulcerated: this was followed by a generalized eruption, and an ulcerated area 2·5 cm. in diameter appeared on the hard palate. The Wassermann reaction and the Kahn test were both triple plus. Preparations from 12 lesions were examined by dark ground illumination, but in only one were spirochaetes seen—two non-motile organisms whose characteristics are not mentioned. A large number of inoculations were made into rabbits and into one *Macacus rhesus* monkey with negative results, except that one rabbit developed a positive Wassermann reaction. Portion of a skin lesion was excised and the micropathological changes are described; no spirochaetes were seen in these sections. Treatment by neo-arsphenamin was followed by rapid disappearance of the lesions and the induction of a negative Wassermann reaction in four weeks. [The diagnosis appears to rest on the clinical and pathological findings, but in reading the account one is left with some hesitation in accepting it as a case of yaws.]

Reference is given to a review of the literature by Fox, who mentions 51 cases observed in the United States, but the majority are poorly reported and occurred in seaports and were therefore probably imported cases (see this *Bulletin*, Vol. 20, p. 178). He also refers to the Californian case under ALDERSON and COE, but this again was an imported case.

H. S. S.

BARKER (F. A.). **A Case of Framboesia in the Nicobar Islands.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. p. 29. With 1 text fig.

Major Barker reports this typical case of yaws as probably the first to be recorded from the Nicobar Islands. The patient, a native of Nankauri, stated that "though there is no other case in his village, the disease is very common in certain villages of Nankauri and the neighbouring islands."

H. S. S.

ESLER (A. R.). **Laryngeal Obstruction in a Case of Yaws.**—*Kenya Med. Jl.* 1925. Feb. Vol. 1. No. 11. pp. 347–348.

Herein is reported the case of a native child, aged two years, suffering from secondary yaws, who was brought to the Fort Hall hospital on account of severe dyspnoea from laryngeal obstruction for which tracheotomy was performed. Two injections of a bismuth salt were given, and the dyspnoea disappeared. No cause for the dyspnoea was discovered, but in view of the effect of treatment by bismuth in this case, and of a similar history subsequently obtained in half-a-dozen other cases of yaws with the same symptom similarly treated, it is surmised that the symptom of laryngeal obstruction was in some way due to yaws.

H. S. S.

MCKENZIE (Alan). **A Case of Syphilitic Infection in a Patient suffering from Yaws.**—*Lancet.* 1924. Dec. 20. pp. 1280–1281.

A clinical record [no laboratory facilities were available] relating to a Polynesian male, aged 20, who, coming under treatment for a traumatic ulcer of the leg in March 1922, developed typical framboesial eruption on the face and chest in the first week in April. For this he received three injections of N.A.B. at weekly intervals ; a total of 1·1 gm. being given. The lesions had all disappeared before the last injection. He was not again seen until Feb. 20 1923, when he presented a typical mucous syphilide on the lip, a typical yaw at the right nostril, and another large yaw between the nates, together with a typical Hunterian chancre on the prepuce, with shotty inguinal glands and a recent history of sore throat. The chancre had appeared a fortnight after intercourse with a known prostitute. All signs cleared up under treatment with weekly injections of 0·9 gm. N.A.B. [total not mentioned]. Giemsa stained smears from the lesions were examined but spirochaetes were not seen.

The author is convinced that this is a case of syphilitic infection in a man already suffering from uncured yaws.

[The evidence thus adduced by a clinical observer familiar with both diseases is of considerable value, and it would be useful if all similar cases were put on record.]

H. S. S.

i. MATTLET (G.). **Traitement des lésions pianiques par les sels de bismuth.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 193–198.

ii. MIGUENS (J.). **Traitement du pian par le dermatol.**—*Ibid.* pp. 141–148. [1 ref.]

i. The author's conclusions regarding the results of treatment by bismuth salts of a large number of cases of yaws among the native population of Urundi may be summed up as follows:—(1) Bismuth salts are as useful in the treatment of yaws as of syphilis. (2) Their use in arsenic resistant cases has been most gratifying. (3) They may be used in cases which do not support arsenic well. (4) Ill effects are practically nil. (5) The method of administration is a simple one and may be placed in the hands of native assistants, a point of practical importance when dealing with a disease widespread among a scattered native population. (6) The cost is small compared to the arsenical preparations.

The drugs used were (*a*) Bischloral, containing 80 per cent. of the metal, by deep intramuscular injection into the buttock at weekly intervals, a total of 0·7 centigramme per kilo. weight being thus administered; (*b*) Dermatol suspended in olive oil according to the formula of Dr. YERNAUX in the *Bruxelles-Médical* of April 26 1923; 3 grammes of bismuth subgallate are incorporated with 29 cc. sterilized olive oil, whereby the suspension contains 5·0 centigrammes of metallic bismuth. Three to seven doses each of 3 cc. were given for an adult; (*c*) Mercury has no place in the treatment of yaws.

Many cases have been watched by the author for two years subsequent to treatment without recrudescence of signs of the disease.

ii. In the second paper the results of the treatment of 15 children by oily suspension of dermatol are given; they were universally good. The dosage here recommended is 1 cc. for infants up to 2 or 3 years; 2 cc. between 3 and 10 years; 3 cc. from 10–20 years, and 4 cc. for adults; the injections are given every 3 or 4 days until lesions have disappeared, a sixth dose being seldom required.

H. S. S.

PALMER (F. J.). **The Treatment of Yaws by Salts of Bismuth.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Jorhaut, 16th & 17th February, 1924.* pp. 19–23.

The author having read of the successful results attending the use of Trepol in the treatment of syphilis made tentative experiment with bismuth salicylate (optimum dosage, 6 grains, in oily suspension, intramuscularly) in a small series of cases of yaws [60 injections only given] and reports favourably.

There is no new information in this paper. The numbers dealt with are very small and the results not detailed.

H. S. S.

GUERRERO (Luis E.), FERNANDEZ (Ricardo) & ROSAL (Irene). **On the Treatment of Yaws by Sodium-Potassium Tartaro-Bismuthate.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 578–582. With 12 figs. [8 refs.]

Three cases of Filippino children treated with this bismuth compound are reported; 0·15 to 0·2 gm. doses intramuscularly every 4th or 5th day were given. A number of radiographs of a case of framboesial dactylitis improving under treatment are figured.

The authors believe that "cure" was effected after 4 or 5 injections, but consider that bismuth is inferior to the arsenobenzols.

H. S. S.

PORTOIS. **L'action de l'airol dans le pian.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. p. 250.

Good results are reported in the treatment of 20 cases of yaws, secondary eruptions clearing after 3 or 4 injections. The author hazards the opinion that the rapid clinical cure is effected by the iodine ion rather than the bismuth in this preparation.

H. S. S.

BEURNIER (A.) & CLAPIER (P.). **Effets du stovarsol dans les lésions de gangosa et dans le pian.**—*Revista Méd de Angola.* (No. especial 1° Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6ª, 7ª e 8ª Sessões.) 1923. Aug. No. 4. pp. 349–366. With 1 plate. [1 ref.]

A communication embodying in detail the results of treatment by means of stovarsol or "190" (acetyl-amino-oxyphenyl-arsenate of soda) of 8 cases of gangosa and 11 cases of yaws, some in hospital at Libreville, others in their villages in the north-west province of French Congo. Of gangosa the authors state that every village has its two or three cases, and they incline to believe that the disease is syphilitic in origin rather than framboesial. The immediate results obtained in the two series of cases were universally good. It remains to be seen whether relapse occurs. The authors, having regard to the liability natives exhibit of developing toxic symptoms after the administration of drugs containing mercury, arsenic, etc., recommend a modification of the treatment advocated in the first place by FOURNEAU in the treatment of syphilis in Europe. They use a dose of 1 gm. for persons of over 50 kgm.; 0·5 gm. for those under 40 kgm.; 0·25 gm. for those between 15 and 30 kgm., administered in tablet form *per os* in the morning before food with or without sodium bicarbonate on alternate days of 15 to 17 days. If lesions have not all cleared up, treatment is recommended with rather smaller doses after the interval of a week. The only complication encountered was diarrhoea, which soon disappeared with temporary cessation of treatment.

H. S. S.

ROUVROY. **Action du stovarsol sur le pian.**—*Bull. Méd. du Katanga.* 1925. Feb. Vol. 2. No. 1. pp. 16–17.

A short report of the results obtained by treatment with stovarsol in five cases of yaws. In four cases, aged between 25 and 30 years, infection had been acquired in childhood, and complaint was made of late plantar lesions with, in a single case, lesions elsewhere on the body. The fifth case was that of an infant, aged 18 months, suffering from florid secondary yaws. Treatment of this child consisted of 0·25 gm. each day for a week, when in consequence of the onset of acute diarrhoea use of the drug was suspended and castor oil given. The diarrhoea soon cleared up, and on the 14th, 15th and 16th days the doses of stovarsol were repeated, all lesions by this date having disappeared. The dosage in an adult case, followed by complete disappearance of lesions, was on the 1st and 2nd days 0·75 gm.; on the 3rd, 4th and 5th days 1 gm., followed by six days with 0·5 gm.

H. S. S.

THIEME (O.). **Meine Erfahrungen ueber 1137 Salvarsaninjektionen bei Framboesie in Samoa.** [Experiences of 1,137 Salvarsan Injections for Yaws in Samoa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 162–171. With 3 text figs.

The author, who died in 1917, had spent 9 years in Samoa, and some of his observations on yaws are now published. They include notes upon the clinical side, and his method of treatment by salvarsan, with references to accidents during treatment. He states that in 9 years' practice, with observations on 9,831 native cases, he never saw a Hunterian chancre, and he believes syphilis to be rare. He mentions that there is a disease among horses in Samoa resembling yaws.

H. S. S.

PATERSON (A. R.). **Note on the Use of a Bismuth Salt in Substitution for Organic Arsenical Preparations in the Treatment of Yaws (*Framboesia tropica*) with Special Reference to the Financing of an Anti-Yaws Campaign.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 581–585. [United Fruit Company, Boston, Mass.]

This paper contains a recapitulation of facts in connexion with the yaws campaign in Kenya Colony which have already appeared elsewhere.

H. S. S.

i. HARPER (P.). **Yaws in Fiji.**—*Kenya Med. Jl.* 1925. Apr. Vol. 2. No. 1. pp. 18–20.

ii. SEQUEIRA (J. H.). **Some Problems of Syphilis.**—*Ibid.* pp. 12–16. (Discussion pp. 16–18.)

i. Dr. Harper, who is one of those who believe that yaws occurs among the Fijians to the exclusion of syphilis, refers to the fact that until recent years all children were inoculated with yaws and that 95 per cent. of the population was affected. The disease is still very common in Fijians over 2 years of age, but major manifestations are less often seen since the introduction of salvarsan in 1911. Hereditary yaws or syphilis is never seen; mothers treated for tertiary yaws in hospital have always borne children healthy at birth, and for some weeks later while under observation. [This would not disprove the possibility of the mother having been treated for an affection which was in reality syphilitic.] The author then goes on to say that there is evidence that yaws is a cause of miscarriage [!], that among the late manifestations of the disease are "sabre tibiae," gummatous ulceration of skin, nasal septum and palate, iridocyclitis, transverse myelitis and of the paraframboesial disease, aortic aneurysm and optic atrophy are commonest symptoms, while tabes and G.P.I. also occur [!]. Dr. Harper states that no case of primary syphilis has yet been reported in a Fijian, though they have access to the many Indian prostitutes, members of the Indian population, who number some 60,000, and among whom syphilis is rife. He believes that the Fijian, owing to past yaws, is immune to syphilis. [This attitude appears, as POWELL has pointed out, to beg the whole question, and for most of those who have studied these two diseases there is obviously enough on the author's own showing to suggest that syphilis does occur among the Fijians. The fact that primary chancres have not been seen and reported goes for nothing, as has been proved in other native populations. On the other hand, there is every probability that the cases of aneurysm and of affections of the nervous system are certainly of syphilitic origin. Why does the author introduce the term "paraframboesial disease"? Tabes and G.P.I. are now known to be syphilitic parenchymatous neurosyphilis, and when the term parasyphilis is just being relegated to an era of uncertain pathogeny, why introduce its analogue, and why place aneurysm in such a category? Aneurysm due to syphilis was never included as a parasyphilitic manifestation.]

ii. A paper read before the Kenya Branch of the B.M.A. by Dr. Sequeira when on a visit to East Africa, in which he formulates a number of questions relating to syphilis and yaws which require answers, with subsequent discussion. Nothing new emanated from any of the contributions made, but the uncertainty with which practically everyone spoke serves to show very well the necessity for further careful study and record of cases before many of the problems of these two diseases can be elucidated.

H. S. S.

BENIGNO VELASCO (C.). **Contribución al estudio clínico del pián.**—*Repert. de Med. y Cirug.* 1921. Sept. Vol. 12. No. 12. (No. 144.) pp. 647–675.

ERNST (John R.). **A Case of Yaws.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. p. 98. With 1 plate.

GISLEN. **Le pian (Framboesia tropica).**—*Arch. Méd. Belges.* 1923. June. Vol. 76. No. 6. pp. 464–472. With 2 figs.

PORTOIS, TILSLEY & MAIRLOT. **Traitement du pian par le tartro-bismuthate de soude et de potasse.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 190–193.

SYPHILIS IN NATIVES OF WARM COUNTRIES.

GILKS (J. L.). **A Medical Safari in a Native Reserve.**—*Kenya Med. Jl.* 1924. Dec. Vol. 1. No. 9. pp. 270–274.

In this article the Principal Medical Officer, Kenya Colony, describes a short visit paid to a dispensary at Assembo, in the Central Kavirondo native reserve, where a treatment centre for yaws and syphilis has been established; treatment being by intramuscular injections of bismuth. " The greater number of the cases of yaws were children " with typical framboesial eruptions, with " only a small proportion showing anything like generalized tertiary lesions." " The cases of syphilis had genital lesions almost without exception; men with primary chancres and women with ulceration, sometimes very extensive, of the pudenda. In one case only was anything like a well-marked secondary rash observed." The author believes that the Kenya native does not suffer so severely when infected with syphilis as the European and speculates whether some partial immunity exists in the native as the result of previous yaws. A large proportion of those *applying* for the specific treatment complained only of " aches and pains "—an observation which is interesting in view of the fact that bone pain was the symptom of syphilis which brought many natives to the venereal clinic at Dakar, as noted by NOGUE. Another large group of those seeking treatment were women, who asserted that they had suffered from syphilis in the past with many abortions in consequence, and that after one or two injections of N.A.B. or bismuth they had given birth to healthy children; that they were now again pregnant and asked for a single injection to ensure the birth of a normal child. Dr. Gilks records these " unsolicited testimonials " to the efficacy of antivenereal treatment with reserve. Such an attitude on the part of the native is typical, and the story told to ensure receiving an injection of " the medicine " is a valuable sidelight on native psychology when it comes to collecting data for statistics. Mention is made that no cases of congenital syphilis were seen, but, on the other hand, " a number of quite small boys and girls applied for treatment for what were clinically primary and secondary lesions of the genitalia." From the context it is not quite clear whether one is meant to understand that in these cases the disease was contracted by sexual contact, a point which is of importance in view of the fact that in other parts of Africa child infection is common enough, but gained by other than sexual contact.

Up to the present time Dr. Gilks points out that there has been no time available for investigation of cases and keeping of records. [The necessity for such investigation and records is imperative before the big problems of yaws and syphilis among native races can be properly understood and tackled, and it is to be hoped that he will before long have funds and staff at his disposal to undertake this work. Comparison of the observations given in this article with those made in other parts of Africa will show many interesting points of divergence worthy of study.]

H. S. Stannus.

i. PATERSON (A. R.). **Venereal Disease Work in Kenya.**—*Kenya Med. Jl.* 1925. Mar. Vol. 1. No. 12. pp. 366–372.
ii. STONES (R. Y.). **Notes on the more Prevalent Diseases in Central Kavirondo.**—*Ibid.* pp. 359–362.

i. A paper read by the Chief Sanitation Officer of Kenya Colony before the Imperial Social Hygienic Congress at the British Empire Exhibition, Wembley, May, 1924. The incidence of "venereal disease" among the natives of Kenya is discussed and the opinion expressed that while it is common in the coast towns and not uncommon in the up-country town, among the rural populations of the Native Reserves the incidence is small. The only figures given, however, refer to 8,000 Kavirondo natives examined two years ago who showed only 1 per cent. with evidence of syphilitic infection. The rest of the paper is given up to a consideration of the lines along which anti-venereal propaganda and treatment may best be directed.

ii. Dr. Stones refers to his "observations made in this hospital [unnamed, but presumably the Church Missionary Society Hospital in the Kavirondo Province of Kenya Colony] during my short period in this country." They refer chiefly to syphilis. He finds constitutional symptoms of the second stage seldom marked with the exception of the "severe encephalitis which occurs and brings the patient for treatment." [Do they really suffer from a severe *encephalitis* or does the author refer to headache ?] Some speculations are then offered as to the cause of "the mildness of the constitutional symptoms." Criticizing a statement by Dr. GILKS (P.M.O., Kenya) that he had never seen a case of congenital syphilis, the author says that such cases are not uncommon. "Of 36 infants with the congenital disease, 22 showed secondary sores in the napkin area ; 9 had the syphilitic wig ; 5 had well-marked snuffles ; 4 epiphysitis ; 3 enlarged livers ; 1 had at three months dactylitis of the fingers." He then wisely refers to the difficulty of distinguishing some of these lesions from yaws and adds that "Hutchinson's teeth, affections of the cranium and interstitial keratitis seem to be rare." Primary sores are not uncommon in men, but seldom seen in women. "Other signs, such as falling hair, sore throat, and rash with fever and anaemia, are rare. Acute synovitis is occasionally met with, but the chronic going on to a Charcot's joint unless arrested is more common, and seems to be associated with the tertiary stage. Tertiary manifestations such as gummata and gummatous nodes on the bones and ulcers are common, as are chronic synovitis and Charcot's joints. Neurosyphilis is conspicuous by its rarity." [This passage is quoted at length as one really fails to understand what Dr. Stones means. If neurosyphilis be rare, how does he account for Charcot's joints being common, lesions which are secondary to neurosyphilis and only neurosyphilis ?]

H. S. S.

FREW & others. **General Discussion on Venereal Diseases.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1924. Dec. Vol. 4. No. 8. pp. 2–7.

This verbatim report of a discussion which took place in December, 1924, contains little information of clinical interest. On the other hand, various speakers emphasized the lack of systematized and coordinated treatment of cases of syphilis occurring among the natives employed on the Rand Mines. The aim and principles of treatment appeared to rest on no sound basis. To anyone reading the report it would certainly appear that the subject requires further investigation. Incidentally, what appears to be a lack of any organized Government campaign against venereal disease among natives in South Africa was mentioned. Venereal diseases, like tuberculosis, should interest the administration of native areas whence " boys " are drawn for work in the Mines, and this report will be read by them with a desire for further information.

H. S. S.

McNaughton (J. G.). **Bismuth Sodium Potassium Tartrate in the Treatment of Epilepsy.** [Memoranda.]—*Brit. Med. Jl.* 1924. Nov. 15. p. 899.

Epilepsy and epileptic insanity have long been known to be common among the native inhabitants of the East African colonies. Dr. McNaughton, of the Tanganyika Territory Medical Service, finding a pachymeningitis in one of these cases "examined post-mortem" came to the conclusion that they were syphilitic in origin and commenced to treat others with injections of the above-mentioned bismuth salt. Short notes of four cases of epileptic insanity so treated are given and also a case of epilepsy with urinary incontinence.

He considers that " in the majority of insane natives in this Territory, the insanity is related to syphilis," and says, " as a routine treatment now all patients receive injections of the bismuth salt. In cases where no improvement results I take it that the disease is not syphilitic in origin."

These cases are briefly given below :—

1. Male insane epileptic. After a serious fit was given 3 gr. doses bismuth salt weekly for 6 weeks : " No fit occurred for 9 months, and he appeared normal." He then had three fits and treatment again commenced : " No further recurrence of fits."

2. Male insane epileptic. Understood to have " been sick in his village for some years " : very obstreperous and noisy, necessitating forcible restraint : 10 injections given ending December, 1923 : " since January he has been quiet and amenable . . . " and " is quite rational."

3. An epileptic maniac who had had fits for three years and had committed homicide : treated by injections from October, 1923, till January, 1924 : " the fits, which had been of almost daily occurrence, *ceased after one week*, and he became quite rational " : some months after ceasing treatment he had a fit, and treatment was restarted.

4. Female, aged 30, admitted with acute mania : " On August 12th she was disturbing the white and native staff to such an extent that she was given a 3 gr. injection of the bismuth salt. The result was marvellous : *she slept on that night*, and has been quiet and fairly rational ever since."

5. Girl, aged 6 years. " Epilepsy complicated with incontinence of urine each night " : weekly injections of 1 gr. bismuth salt given between October and Deember, 1923. "*After the first injection the fits, which had been of almost daily occurrence, ceased, so did the nocturnal incontinence* " : she was discharged the following March apparently cured : in June fits recurred, and 10 more injections were given : " so far there have been no further fits."

[Practically no previous history is given in these cases ; no mention is made of history or signs of infection with syphilis, no Wassermann reactions were apparently done and no cerebrospinal fluids examined. The presumption of syphilis as the cause rests therefore upon the finding of pachymeningitis in a few cases, and on the results of treatment. Attention should, however, be drawn to the statements made in the notes of the last three cases which have been italicized; they may be the clue to the explanation of the results of treatment. It is hardly possible to believe that the subsidence of symptoms following *immediately* on a single injection were due to the effects of the drug upon some causative syphilitic lesion in the central nervous system; it seems more likely that the condition which was so successfully treated was the superimposed hysterical manifestations. Many fits in epileptics are of this nature; in some cases it has been shown that the majority of the fits are hysterical though indistinguishable from the true epileptic fit. One must remember, too, in dealing with the East African native that he is a very suggestible person. Many cases of epilepsy in East Africa may be syphilitic in origin, but one feels that the case is as yet not proven. The problem is very interesting, and one of importance, as many homicides in these countries are committed by this type of lunatic. May we look forward to a complete investigation of the subject by Dr. McNaughton ?]

H. S. S.

HALL (Giles A. M.). **Extragenital Chancre.** [Memoranda.]—*Brit. Med. Jl.* 1924. Nov. 15. p. 899. With 1 text fig.

Records the case of a chancre situated on the lower and inner part of the bulbar conjunctiva in a Chinese woman aged 23 years. The presence of *Treponema pallidum* was proved, but the serum was negative to a modified Sachs-Georgi precipitation test. The source of the infection was untraced. Syphilis is stated to be rife in Tatungfu, Sha, a large garrison town just outside the Great Wall of China, and a very large number of cases of extragenital chancres is seen—lip, tongue, tonsil, mamma, abdominal wall and rectum.

H. S. S.

NEUBERGER (J. K. W.). **Luetische Pseudotumoren. (1) Tumor ventriculi, (2) tumor musculorum abdominis, (3) tumor orbitalis.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 5. pp. 746–755. [23 refs.]

In the three cases quoted the symptoms suggested surgical affections. Only in case 3 was the tentative diagnosis syphilis made and specific treatment administered before operation.

The wide spread of unrecognized or insufficiently treated syphilis in the tropics, as well as the diverse manifestations which it may produce, should make the surgeon in the tropics cautious in every tumour case, and give specific treatment a trial when syphilis is even vaguely suspected.

W. J. Bais.

LEVADITI (C.), NICOLAU (S.), SALGUE (J.) & SCHOEN (R.). **Mécanisme d'action du bismuth dans la syphilis.**—*C. R. Acad. Sci.* 1924. Nov. 3. Vol. 179. No. 18. pp. 939–942. [4 refs.]

A study of the mechanism of absorption of bismuth administered by intramuscular injection and its mode of action upon spirochaetes at the seat of a primary syphilitic lesion. Five rabbits with primary chancre on the scrotum and seven controls were injected with trépol, 0·1 gm. per kilogramme weight, the former being killed after 1, 2, 3, 4 and 6 days, the controls at the end of 7, 8, 11, 13, 15, 20 and 25 days. The chancres were examined histologically and chemically and microchemically, the muscle at the site of injection by the first two methods. The results showed that :—

(1) The amount of bismuth absorbed is minimal, even after a considerable lapse of time ; (2) the destruction of the spirochaete in the lesion is effected by the presence of such minute quantities of bismuth as defy determination by chemical methods ; (3) the spirochaetes retain a normal appearance for 24 hours after the treatment, but from the second day they show granular degeneration ; (4) the bismuth salt is dissociated under the influence of a leucocytic exudation, and the metal set free ; this unites with proteid substances derived from the broken down leucocytes and is absorbed by mesoblastic cells and vascular endothelium, and thus in infinitesimal amounts is carried to the specific lesion where spirochaetolysis is effected ; (5) the muscle injected at first undergoes coagulation necrosis, with myophagy, followed by regeneration commencing on the third day.

H. S. S.

TANGANYIKA TERRITORY. ANNUAL MEDICAL REPORT FOR THE YEAR ENDING DECEMBER 31ST, 1923. pp 171–177.—**Third Report upon Treatment with Bismutho Sodium and Potassium Tartrate.** [DAVEY (J. B.), ILES (M.), MCNAUGHTON (J. G.) & MOOLE (Y.).]

The results obtained in the treatment of syphilis and yaws by bismuth preparations have been encouraging, the average dose of the salt being 2 grains intramuscularly every fifth to seventh day. A large proportion of cases appear to have developed stomatitis as the result of treatment, and a number of deaths are reported, facts which emphasize the necessity when dealing with natives, especially the debilitated or those suffering from intercurrent infections, of proceeding with great caution.

So far these diseases are being treated by medical officers at the Government hospitals situated in the various more important townships. " Some hundreds " of cases only are reported. Probably, if treatment could be carried to the native in his own home far removed from centres of civilization yaws would be found to be very prevalent, and the numbers seeking treatment would run into tens of thousands.

H. S. S.

CLARK (H. C.). **A Survey at Tela Hospital to determine Syphilis.**—*United Fruit Company. Medical Department. Twelfth Annual Report.* 1923. pp. 147–162. [11 refs.]

The greatest industry on the North Honduras coast is fruit growing. A relatively small force of white Americans and English controls and directs the labour of a much larger number of young adults drawn from all parts of Spanish Honduras, and to a less extent from the West Indies (Negroes). This survey was not intended to show how many patients were treated primarily for their syphilitic infection, but rather to learn the prevalence of the disease in the community and then analyse any facts elicited in the histories of the patients. Dr. Clark used a modification of the Noguchi complement fixation test, such as had been found reliable at the Board of Health Laboratory, Panama Canal. He notes the increasing volume of opinion, founded on critical experience, that, apart from exact clinical search, a reliable "Wassermann-Bordet" test, in skilled hands, is of undoubted value in determining the incidence of syphilis in a community; for, according to CRAIG (whose experience in this respect is almost unrivalled)—"The cases of syphilitic infections that are apparently without clinical symptoms far outnumber those that present typical symptoms."

Dr. Clark gives details of his Wassermann technique, tabulates results, and analyses them under categories of age, sex, residence, employment, in or out patient, diseases, casualties and race. The criticism is thorough.

Yaws is rare in the district and could not materially affect the Wassermann results. Actually, 1,234 males and 200 females were tested—about half the total number of patients treated at Tela Hospital from November 14th, 1922, to end of September, 1923. One table only may be here given :—

Races.	Number.	Positive. (++)	Doubtful. (+)	Combined Per cent. (probable Syphilis).
Negroes and mulattoes...	200	52 (26%)	18 (9%)	35%
Latin-Americans ...	1,113	147 (13.2%)	75 (6·7%)	19·9%
North Americans and Europeans	104	10 (9·6%)	13 (12·5%)	22·1%
Syrians	14	2 (14·2%)	2 (14·2%)	28·4%
Chinese	3	—	—	—

Dr. Clark points out that most of his negroes came from the West Indies and former yaws in their case cannot be confidently excluded. But VEDDER'S report on enlisted coloured soldiers U.S. Army shows 36 per cent. probable syphilitics. The Panama Canal 1916 report gave 30 per cent. probable syphilis in negroes. The Panama Canal rate for probable syphilis in whites is 16 per cent. for both civil and military forces: compare with this Peter Bent Brigham Hospital rate 15 per cent. probable syphilis of all patients admitted, while the Bellevue Hospital gives a rate of 25 per cent. The Panama Canal rate for Latin-Americans was 26 per cent.

The reviewer may, perhaps, be allowed to comment here that a (?)finer sensibility has so far prevented any survey, worth quoting, of probable syphilitics in the hospital patients of England, but all physicians must now be aware of the fact that it would be found to be somewhere about 15 per cent. It is now known that a negative Wassermann does not exclude finally the possibility of syphilis, in any stage, in any patient, and can carry no weight against informed clinical findings and history of case: on the other hand, "positives," of varying degrees of doubtfulness, are often found in cases who are not syphilitic.

Malaria is well known to give occasionally a "positive" Wassermann in non-syphilitics—especially if the blood be taken during a paroxysm. In the reviewer's experience true malaria positives have always been weak or doubtful positives (Medical Research Council: Wassermann test No. 1) and have not persisted. A definite positive++has persisted and has meant syphilis (yaws being excluded), as confirmed later by results of anti-syphilitic treatment, if not by clinical signs or history. Dr. Clark's analysis of his Wassermann results in relation to malaria is of interest, and value, to physicians in tropical practice. He argues with force, that if malaria, or any other disease, is to influence the result of the test it should in a large number of cases of the disease reveal a higher rate of positive tests than the normal incidence of positives obtained in a general survey: and any marked increase in the disease at different periods of the year should be accompanied by a rise in false results in the application of the test. His comparison of the net results of the tests in the cases of malaria, helminthiasis, and external violence shows that the rate has not been materially changed. Moreover, the tables showing the monthly admissions for malaria and alongside the monthly incidence of positive Wassermann tests do not reveal any parallel increase with malaria, of the positive Wassermanns. 315 malaria fever cases showed 10·7 per cent. positive (++ and +) Wassermann results. During the same period 84 subjects of external violence admitted to hospital gave 10·7 positive Wassermann results.

There is no evidence in Dr. Clark's careful analyses of results that malaria offers any significant interference with the test, though he found in a few cases of malaria a transient positive + result.

H. M. Hanschell.

WALRAVENS. **Prophylaxie des maladies vénériennes.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 155–165.

Dr. Walravens, Director of the Laboratories at Elizabethville, relates the facts which led to the Belgian Government making a decree dealing with the compulsory notification and treatment of venereal diseases in the Belgian Congo, and quotes the rules made under a local ordinance giving effect to this decree. The regulations, which apply to both European and native, follow very much upon the lines laid down by the 1919 law in Sweden, and include under the term venereal diseases, syphilis, gonorrhoea and chancroid; treatment to be continued until "cure" is effected as certified by the medical man.

The writer points out the conditions under which it may be possible to administer this decree as affecting syphilis, but mentions the difficulties with regard to gonorrhoea.

[It will be interesting to see what degree of success follows this method of compulsion in a native colony. All such laws bring difficulties in their train, and it is questionable whether any law is good law which must remain a dead letter in certain of its applications. No standard of cure is mentioned nor are methods of treatment dealt with.]

H. S. S.

NEVES (J. da Silva). **A lucta antivenérea nas Colónias.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a. Sessões.) 1923. Aug. No. 4. pp. 167–177.

In this paper Dr. Neves, Director of the Urological Department of the Central Hospital, Loanda, discusses the question of antivenereal work chiefly in relation to prostitution. The familiar arguments for and against regularizing prostitution, notification, compulsory treatment, personal prophylaxis, etc., are traversed. The necessity for providing treatment for syphilis is, of course, recognized, but in regard to gonorrhoea he quotes JANET, who believes that it is better not to attempt to cure gonorrhoea in prostitutes, as they will immediately become reinfected; rather allow the infection to lose its virulence and wear itself out. The paper contains no information as to the prevalence of the diseases in Angola nor upon actual treatments used.

H. S. S.

PIJPER (Adrianus). **Two and a Half Years' Work at an Anti-Venereal Clinic for Natives and Coloured Persons.**—*S. African Med. Rec.* 1924. Aug. 23. Vol. 22. No. 16. pp. 369-372. [5 refs.]

The total number of persons treated for venereal disease in this 2½ years at the Pretoria Clinic was 2,150, of whom only 21, or 1 per cent., were cases of gonorrhoea. This low figure, it is pointed out, is probably due to the fact that the native neglects gonorrhoea as a trivial complaint and does not seek treatment.

The incidence of syphilis as gauged by the Wassermann reaction among the general native population attending the General O.P. Dept. of the hospital was 57 per cent., or among the total native population of Pretoria of 23,000 there are 8,500 suffering from syphilis.

The clinical manifestations of the disease are dealt with very briefly. "Rheumatism and neuritis" were commonly complained of; skin eruptions, condylomata and gummatous ulcerations with caries of the nasal bones were commonly observed [but no statistics are given]; mention is also made that "eye complaint and headaches, lung affections resembling phthisis and all kinds of kidney and stomach troubles are represented; cases of "syphilitic asthma" and "syphilitic diabetes" were also seen. [The diagnosis in all these cases rests apparently upon the fact that symptoms and signs cleared up under anti-syphilitic treatment.]

The M.O.H., Pretoria, is quoted as reporting that there is no natural increase of the coloured (native) population; 1,200 adult married patients suffering from syphilis had produced 4,725 children, of which 2,064 had died, and this loss of child life and lack of increase of population is ascribed to syphilis, without any further reasons being given. [There is no information about miscarriage rate forthcoming, and no mention is made of heredo-syphilis.]

Syphilis insontium is believed to be common [it undoubtedly accounts for a considerable proportion of cases among native races]. Treatment was by means of neosalvarsan or substitutes given intravenously, with mercury and potassium iodide by mouth. The usual difficulties in getting patients to attend regularly and for full courses of treatment were encountered. 74 attended for Wassermann reaction only; 523 for one injection; 373 for two; 209 for three; 170 for four; 229 for five, and 549 for six or more injections.

H. S. S.

Allain. La lutte anti-vénérienne à Madagascar pendant l'année 1923.—*Ann. de Méd. et de Pharm. Colon.* 1924. May-June-July-Aug. Vol. 22. No. 2. pp. 211–215.

The following table from this communication gives at a glance the scope of the campaign being undertaken in Madagascar :—

	1921.	1922.	1923.
Number of dispensaries	7	27	49
Number of consultations	24,714	69,227	146,697
CONDITIONS TREATED.			
Primary syphilis	63	387	785
Secondary syphilis	1,126	4,342	10,976
Tertiary syphilis	4,613	22,644	33,683
Hereditary syphilis	592	3,281	6,133
	6,394	30,654	51,577
Gonorrhoea	760	1,716	4,519
Simple chancre...	64	148	751
Skin affections and Yaws	1,119	1,815	9,337
METHODS OF TREATMENT.			
Arsenical injections	4,100	11,476	31,409
Mercury biniodide injections ...	10,519	31,854	40,298
Mercury cyanide injections	1,110	816	4,307
Gray oil injections	174	2,096	4,188
Mercurial frictions	836	180	226
Iodide treatments	7,383	3,362	27,669

There is little else to note. In 1923 over 30,000 intravenous injections of arsenical preparations were given without serious accident. No case of neuro-syphilis was met with.

H. S. S.

Nogue (M.). La syphilis chez les noirs au Sénégal. La lutte contre la syphilis à Dakar.—*Revista Méd. de Angola.* (No. especial 1^{c} Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 179–199. With 7 plates. [45 refs.]

The subject matter of this communication is practically the same as that contained in a paper by the same author, with the same title, published in *Ann. d' Hygiene Publique, Industrielle et Sociale,* and reviewed in this *Bulletin,* Vol. 21, pp. 799–800. Nothing need be said, therefore, except again to draw attention to the admirable clinical records of syphilis among African natives therein given.

H. S. S.

Wright (L. T.). [Ainhum : Report of a Case occurring in a Man with Syphilis.]—*Urol.& Cut. Rev.* 1924. Mar. [Summarized in *Brit. Jl. Derm. & Syph.* 1924. Oct. Vol. 36. No. 432 (No. 10). p. 443.]

The author thinks that the relationship between syphilis and ainhum is worthy of further consideration. He considers that the complete diagnosis can be made by the type of bone absorption as shown by X ray examination.

H. S. S.

LEPROSY.

MITCHELL (J. Alexander). **Leprosy Administration.** [Government Circular.]—*S. African Med. Rec.* 1924. Nov. 22. Vol. 22. No. 22. pp. 529–531.

The South African Union Health Department has issued a statement of its policy with regard to leprosy administration. This includes a "Leprosy Survey" to determine the extent of the problem, no effective inquiry having been made since 1911, when 1,300 free cases were estimated in Transkei alone; an educative and publicity campaign, for removing prejudices due to erroneous beliefs that the disease is hereditary and highly infective through the air even to a distance, instead of being only slightly infectious after prolonged close contact; the appointment of a Leprosy Advisory Committee to include the prosecution of research work; the full use of the latest treatments; encouragement of voluntary isolation in the earliest stage; the discovery and segregation of all active infective cases; the appointment of a Leprosy Board, of both official and non-official medical men, to report periodically on all segregated lepers and to recommend the discharge of recovered and uninfective cases, 597 such cases having been already released subject to periodic clinical and bacteriological examinations; to authorize home segregation in suitable cases; gradually to convert Leper Institutions into "Leper Sanatoria" providing the best treatment for early voluntary cases, as with tuberculosis; and to secure the active co-operation of everyone concerned in combating the disease: all very excellent measures suitable for adoption elsewhere in leprosy-infected portions of our Empire, and based on the latest medical knowledge. Dr. J. A. Mitchell, Secretary for Public Health, is to be congratulated.

L. Rogers.

SOUTH AFRICAN MEDICAL RECORD. 1925. Feb. 14. Vol. 23. No. 3. pp. 51–52. **Leprosy Advisory Committee.**

This is a report of a meeting of the Leprosy Advisory Committee in December, 1924, at which the policy of the Department of Public Health dealt with in the preceding abstract was endorsed. The Government was asked to reduce, as far as possible, the heavy cost of institutional segregation, to spend some of the money saved on research, and to improve the treatment in the leper institutions, the excessive cost of the Robben Island colony being pointed out.

L. R.

ROBINEAU (Marcel). **La prophylaxie et le traitement de la lèpre chez les races primitives de l'Afrique Équatoriale.**—*Presse Méd.* 1925. Feb. 21. Vol. 33. No. 15. pp. 243–245. With 3 text figs. [3 refs.]

Dr. Robineau, an experienced French Colonial medical officer, deals with the difficult problem of prophylaxis against the widespread leprosy in tropical Africa, 52,000 lepers being estimated in a portion only of French Equatorial Africa. Any attempt at the collection and segregation of the lepers by force is rightly condemned as futile, the best plan being to send fairly early treated lepers in pairs through the villages to persuade other infected persons to come voluntarily to the leper village to obtain the benefit of the improved treatments, and this plan has been found to yield good results. All new cases are confirmed bacteriologically before admission, for which purpose puncture of any enlarged glands and staining for acid fast bacilli is recommended in doubtful cases. All segregation must be voluntary, and no force ever used in collecting the patients, who must be attracted by the provision of free lodging and food, and land to cultivate towards their own support around the unenclosed leper villages, constructed according to the native plans, so that they feel at home. A hospital for helpless crippled cases, meeting-houses, schools and crèches for infants should be provided and religious freedom ensured. They should be classed in accordance with the clinical stages of the disease, with a special quarter for the infirm, and not according to social distinctions. Healthy infants of lepers should be nursed by healthy women, as artificial feeding is rarely practicable in the tropics, or goats' milk may be used, but negro women often object to giving up their infants unless they are placed in a neighbouring crèche, where their mothers can visit them once a week. Good hygiene and the best treatment should be provided, since leprosy is no longer to be regarded as incurable under persevering treatment. This is fully appreciated by the blacks and attracts them to the isolation villages, but a great field remains open for further research to perfect the methods of curing leprosy.

L. R.

ROBINEAU (M.). **La lutte antilépreuse dans une circonscription du Cameroun.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 385–392.

This paper deals with similar material to one in the Transactions of the Strasbourg Leprosy Conference already dealt with in this *Bulletin.* It emphasizes the difficulty in segregating lepers in tropical Africa and the necessity of attracting them to come for treatment. Intramuscular injection of chaulmoogra esters is the best method, although very prolonged treatment and infinite patience is required to obtain good results.

L. R.

CORREIA (Germano). **A lepra em Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a, e 5a Sessões.) 1923. Aug. No. 4. pp. 369–374. With 1 chart.

A brief paper showing that Angola is not an important centre of leprosy. Records are tabulated which demonstrate that there have been 30 deaths from this disease since 1873, of which 27 occurred in Loanda, 2 in Mossamedes and 1 in Benguela. No estimations of the actual number of cases is attempted.

H. Harold Scott.

GENEVRAY (J.). **La lèpre en Nouvelle-Calédonie.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14 & Feb. 11. Vol. 18. Nos. 1 & 2. pp. 78–89. pp. 158–177. With 6 figs. & 3 maps in text.

This paper gives a long account of leprosy in the French Australasian colony of New Caledonia, with a full history of the well-known outbreak there. It brings out the fact that the disease is now decreasing considerably, and accounts for it mainly by the originally almost solely nodular infectious type of cases having become altered to show a considerable proportion of the relatively little infective nerve type, especially in the islands first infected. Many of the European convicts became infected, but they have for some time been isolated, and their numbers have fallen from the highest point of 211 to 158 in 1924; the death of 1,113 lepers of all nationalities in the last 10 years has played an important part in their reduction. The attempts to isolate the lepers, first in numerous leper villages, then in one central island colony, which had to be abandoned on account of its cost, and again in villages without much supervision are narrated, and the comparative failure of the attempts yet made to deal with the disease is pointed out. The laws are excellent, but lack of funds prevents their being enforced, and the writer advocates the appointment of a special medical officer to inspect all the leper villages and to carry out the laws regarding the discovery and isolation of the infected. He is of the opinion that if this done, and with proper financial support, it will prove successful in reducing the disease far more rapidly than hitherto.

L. R.

DOUGLAS (A. R. J.). **A Visit to Culion Leper Colony, Philippine Islands.**—*Lancet.* 1925. Jan. 17 & 24. pp. 143–145. With 1 text fig; 201–204. With 1 text fig. [11 refs.]

This is a general account, with no claim to originality, of the well-known Culion Leper Colony, based on a visit paid to it last year. It covers familiar ground dealt with in papers by the Culion medical staff in papers recently reviewed in this *Bulletin,* and includes an illustration of a group of 225 " negative " lepers awaiting the completion of six months " negative period " before their release. This furnishes graphic evidence of the full use which is being made in this, the largest leper colony in the world, of the recent advances in our knowledge made by the splendid American and Filippino staff there.

L. R.

WOOD (Leonard); OLDRIEVE (Frank); DOUGLAS (A. R. J.); MCKEAN (James); BARTLETT (C. L.). **Leprosy Work at Culion.** [Correspondence.]—*Boston Med. & Surg. Jl.* 1925. Mar. 19. Vol. 192. No. 12. pp. 571–576.

The correspondence consists of letters forwarded for publication by General Leonard Wood, Governor of the Philippines, including reports made to him by visitors to the Culion Leper Settlement. The most important point is made by Mr. Oldrieve, when he urges the immediate necessity of providing homes for the untainted children of the lepers so as to put a stop to the numerous infections which have taken place among them ever since the colony was opened.

L. R.

PANAMA CANAL. **Report of the Health Department of the Panama Canal for the Calendar Year 1923.** [FISHER (H. C.).]—**Palo Seco Leper Colony.** [TUCKER (Frederick D.) & HORWITZ (Philip).] pp. 45–52. With 1 plate.

In January, 1923, 70 remained in this Colony, 14 were admitted during the year, 4 died, 6 were paroled, and 74 remained at the end of the year. Average duration of the disease at death was 10 years and of stay 5 years. Of the paroled cases the average duration was 6 years for males and 4 for females, and the stay 4½ years; 38 were West Indians, 35 Panamanians, 4 Colombians, 2 Chinese, 1 Haitian, and 1 Ecuadorian. Chaulmoogra esters were injected regularly and definitely arrested the progress of the disease in early and in fairly advanced stages, but progress often becomes slow after a time.

L. R.

PUPO (Aguiar). **A prophylaxia da lepra em S. Paulo. Defesa do "Leprosario de Santo Angelo." Moção ao Sr. Presidente do Estado.**—*Ann. Paulist. Med. e Cirurg.* 1924. Nov. Year 12. Vol. 15. No. 11. pp. 261–270. [1 ref.]

Leprosy was originally introduced into Brazil by Portuguese colonists, and during the last 30 years its spread has been great. In S. Paulo in 1916, when the first reliable estimations were made by RIBAS, there were 1,171 cases; in 1920, RIBEIRO found 4,115 cases, and estimated the total as not less than 4,500, or one per mille. At a Medical Congress in December, 1915, suggestions were made for compulsory notification, for isolation of poorer patients in leper colonies, and domiciliary treatment of others, for the care of families of indigent lepers, prompt separation of the children of leprous parents, prevention of immigration of lepers, notification of change of residence of those afflicted, disinfection of their houses, and so forth.

The second part of the paper deals with objections raised against the Santo Angelo leprosarium, mainly on account of its being situated near the capital and on the bank of the River Jundiahy, a tributary of the Tieté. These objections are stated to have no sound foundation.

H. Harold Scott.

ABEN-ATHAR (Jayme J.). **Considerações sobre a endemiologia e a prophylaxia da lepra.**—*Sciencia Medica.* 1924. Dec. 31. Vol. 2. No. 12. pp. 697–702.

By figures and returns from some of the chief districts of Brazil the author shows that leprosy is in the indigenous largely a disease of childhood and early adult life, so that, as in yellow fever and tuberculosis, repeated inoculations in early years set up a degree of immunity which protects adults of maturer years. Examination of the returns of patients infected later in life shows that the majority are immigrants. The question of prophylaxis is barely mentioned.

H. H. S.

Paz Soldan (Carlos Enrique) & **Monge** (Carlos). **La lepra en el Perú. Communicación presentada a la Academia de Medicina.**—*Cronica Méd.* 1924. Nov. Vol. 41. No. 737. pp. 344–350. [6 refs.]

A propos the case of a woman, 25 years of age, suffering from leprosy and coming from Huallanca in the Department of Huánco, the authors present a table taken from official records showing that in the hospitals of Lima during the nine years 1913–1921, inclusive, there have been 31 persons admitted for leprosy, of whom 5 have died. From investigations which they have made they conclude that leprosy is rare in Peru, the chief foci of the disease being the banks of the River Ucayali. Although the population there is small and scattered, the danger of spread must not be overlooked. The case recorded came from a district hitherto believed to be free from leprosy, and another noted by **Fraser** in Talara points to the possibility of a focus on the neighbouring frontier of Ecuador. Medical men are asked to help in determining the actual number of lepers in Peru.

H. H. S.

Fordyce (John A.) & **Wise** (Fred). **Leprosy in New York City.**—*Arch. Dermat. & Syph.* 1925. Jan. Vol. 11. No. 1. pp. 1–48. With 40 text figs. [11 refs.]

This account of the occurrence of leprosy in New York is illustrated by an excellent series of photos of cases in various stages, mostly fairly early ones, and contains a table of 47 cases, aged from 7 to 55, 37 of whom were males; 29 were whites, 11 mulattoes, 6 Chinese and 1 a negro, but only three had been born in the United States, most of them having come from South America and the West Indies. The difficulty in recognizing the earliest stages, which are often concealed, is emphasized; the very varying incubation period, the frequent positive Wassermann reactions, and the contagiousness are discussed, the latter being definite but slight, and microscopical sections of skin and liver nodules are illustrated. The paper is a valuable one for those who only occasionally meet with the disease.

L. R.

MacLeod (J. M. H.). **Contact Cases of Leprosy in the British Isles.**—*Brit. Med. Jl.* 1925. Jan. 17. pp. 107–108.

The writer reports three interesting cases: (1) A boy, aged 12, who had never been out of Ireland, developed nodular leprosy contracted from his father, a poor Russian who had emigrated there with advanced nodular leprosy; (2) a boy, aged 15, with nodular leprosy, who was born and had always lived in Lancashire, but whose elder brother returned from British Guiana with nodular leprosy in company with his uninfected parents. The younger child, born in England soon after his parents' return, had been in close association with his leprous brother "with whom he had slept for five years, and from whom he contracted the disease." Both boys died of leprosy; (3) a Belgian woman married in England a man suffering from nodular leprosy, with whom she lived without any precautions, and contracted the disease from him. [It is very suggestive that two, at least, of the patients slept in the same bed with a nodular leper for some years before contracting the disease, as in the case of the former well known Dublin infection : an easily avoidable and quite unnecessary exposure.]

L. R.

SEYFARTH (C.). **Ein Besuch in der Leproserie " Spina longa " bei Kreta (Griechenland).** [A Visit to the " Spina Longa " Leprosery off Crete.]—*Deut. Med. Woch.* 1925. Apr. 17 & 24. Vol. 51. Nos. 16 & 17. pp. 665–666. With 10 text figs. & pp. 705–706. [5 refs.]

The author gives an interesting account of the leper colony established in 1904 at Spina Longa, an old ruined island-fortress off the coast of the larger island of the same name in the Bay of Mirabella, north-east Crete. It has now become the leper colony for the whole of Greece.

The lepers occupy themselves in housework, gardening, and the preparation of their food. Among the 210 are rather more men than women, mostly between the ages of 35 and 50. The youngest is a lad of 16, the youngest woman is 25. There are also a few older patients up to 70 or 75 years of age. The number always remains about 200-250. The average number of deaths each year is 30 and the number of fresh arrivals about the same. All the inhabitants of the island are lepers with the exception of four elderly wives who accompanied their leprous husbands voluntarily to the leper colony. None of them show any signs of leprosy. One case of infection, however, has occurred in one of the boatmen who bring over the raw foodstuffs daily from Plaka. After 8 years of such intercourse he developed leprous rhinitis at the age of 35, followed by nodular leprosy. Marriages between the lepers are not rare. The author was shown a 4 weeks old infant born of leprous parents. Since 1904, 12 others have been born on Spina Longa and survived. All are said to be quite healthy, and 9 of them have been transferred to an orphanage at Athens after living with their parents on Spina Longa from birth to various ages from 6 months to 10 years. Two others have been adopted by relatives.

All stages and forms of the disease were seen. The following are the proportions :—

Nodular leprosy...	about	30	patients.
Nerve leprosy	,,	70	,,
Mixed forms	,,	100	,,

The author draws attention to the almost unrivalled wealth of material on Spina Longa for the study of leprosy, and concludes with some proposals for the improvement of the colony, which he considers is very appropriately situated. When the island has been transformed into a worthy sanatorium for lepers it will be possible to carry out a systematic scheme for the control of leprosy in Greece and Crete. At the present time, unfortunately, the Greek Government is not in a position to make the necessary improvements.

L. R.

TORNABUONI (Giuseppe). **La Lepra nella Toscana Marittima.**—*Riforma Med.* 1925. Feb. 9. Vol. 41. No. 6. pp. 140–141.

Believing that the number of lepers was greater than the published records would indicate, the author made enquiries and investigations in Pisa, Liverna, Lucca, and in part of Spezia, and discovered 32 cases

(26 men and 6 women), of which only two had contracted the disease locally. Fourteen were of the nodular type, eight anaesthetic, and ten mixed. A great majority, 22 out of the 32, were found in the Province of Lucca. The local medical men, he states, do not understand the importance of adequate treatment. Statistics of the Minister of the Interior give 186 as the total number of lepers resident in Italy in September, 1923, but later figures bring the total to 230.

H. Harold Scott.

CEDERCREUTZ (Axel). **Spetälskans förekomst i Finland.** [The Occurrence of Leprosy in Finland.]—*Finska Läkaresällskapets Handlingar.* 1925. Feb. Vol. 67. pp. 143–153. With 2 maps & 3 curves.

In 1924 there were 57 known cases of leprosy in Finland—29 men and 28 women—corresponding to one leper in about 60,000 inhabitants. From 52 cases in 1893 the total rose to 67 in 1897 and 95 in 1904, but has now decreased considerably. Six of the men and eight of the women who were married had altogether 76 children, and amongst this progeny, some of whom had, of course, died, only one case of leprosy occurred, in a man now 48, who had had leprosy for five years. The majority of the cases occur in South West Finland. There has been a gradual rise in the age of the patients since 1897; in 1924 the mean age was 56·8 years; 70·2 per cent. of the lepers are now over 50 years of age. During the last 20 years the number of cases of nodular leprosy has considerably diminished in proportion to those of the anaesthetic variety. This also is a sign that the disease is steadily decreasing in Finland, as the nodular form is considered to be much the more contagious. One of the most important reasons why leprosy is on the decline in Finland is that a well-managed leper asylum was opened in Orivesi in 1904. Regarding infectivity, it is stated that four cases of leprosy occurred successively in the manageresses of a small hotel in the Åland Islands, and it is suggested that infection may be transferred from one generation to another through the furniture, with which in such cases women principally come in contact, and which has not been properly disinfected. Some control of the lepers living out of an asylum is advocated, and the appointment of an inspector, such as has existed in Norway with great benefit for several years, is suggested. It would be advisable to set aside a sum of money, beyond the cost of the Orivesi Asylum, to help the lepers, the majority of whom have only small means, and to make life in the asylum attractive to them so that fewer would be at large and a danger to the community. In this way Finland would in 20 years be as good as free from leprosy and would get rid of the slur of being numbered amongst the European countries in which autochthonous cases of leprosy occur.

E. E. Atkin.

MUIR (E.). **The Predisposing Causes of Leprosy.**—*Lancet.* 1925. Jan. 24. pp. 169–171. With 1 text fig. [6 refs.]

"There is probably no disease in which predisposing causes play a more important part than in leprosy." This dictum is illustrated by striking examples of temporary or permanent predisposing causes, the former including attacks of febrile diseases, such as enteric, influenza, or small-pox, the extra strain of pregnancy, the climacteric of puberty, or unfavourable diet, climate or surroundings; while among the latter are narrated syphilis, chronic bowel affections, and tropical fevers, including malaria and kala azar, or hookworm disease. One or more predisposing causes are commonly found in leprosy, and if present and removable the prognosis is improved greatly. On the other hand, in the more advanced stages of leprosy the onset of a specific fever may result in resolution and even disappearance of the leprosy lesions. Every one of ten advanced lepers developing kala azar improved rapidly as far as the leprosy was concerned, nodules and skin infiltration rapidly disappearing, and less marked improvement was noticed after dengue, malaria, cholera, dysentery and even pregnancy. Leprosy in the earlier increasing stages may be rendered worse by such reaction-producing diseases, but if they occur during the descending curve after leprosy has reached its height and the infection begun to decline, such complications may produce a beneficial effect, and in this stage treatment and exercise may be pushed with good results, most deformities being due to lack of vigorous treatment in the later stages of the disease.

L. R.

WOOD (D. J.). **Ocular Leprosy.**—*Brit. Jl. Ophthalm.* 1925. Jan. Vol. 9. No. 1. pp. 1–4. With 2 figs. in colour.

The writer has studied the eye lesions in lepers at Cape Town, which he finds to consist of progressive irido-cyclitis of an insidious nature, quite different from ordinary forms of iritis, and going on to occlusion of the pupil and opacity of the cornea, lens and vitreous, with shrinking of the eyeball. It begins with very small yellow lepromatous points on the iris, which becomes so rotten and brittle that iridectomy fails; but glaucoma never results. The lesions are best studied with the slit-lamp and the binocular microscope. The condition is illustrated by a small coloured plate showing small white rounded nodules raised above the surface. The cornea shows large numbers of white spots at variable depths. In a recent case the writer has injected subconjunctivally 1 per cent. sodium taurocholate added to 1 in 2,500 bicyanide of mercury in 2 per cent. saline with definite improvement, such as he has never seen before.

L. R.

NEWSHOLME (Arthur). **A Note on the Causes of the Historical Reduction of Leprosy.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 791–795. [2 refs.] [United Fruit Company, Boston, Mass.]

In this short paper the well-known statistics of the reduction of leprosy in Norway by means of segregation of only a portion of the infected are quoted to show that complete isolation of all cases is not necessary in such a slightly infectious disease to bring about a great diminution of leprosy, and the lesson is applied to tuberculosis, the domiciliary and institutional treatment of which, especially the latter, may be expected to reduce the disease materially even if incomplete. The importance of the improved treatment of leprosy in leading to a more rapid diminution of the disease in the tropics is also emphasized.

L. R.

ROGERS (Leonard). **The Prophylaxis and Treatment of Leprosy, with Special Reference to Tropical Africa.**—*Kenya Med. Jl.* 1925. Feb. Vol. 1. No. 11. pp. 322–330. [3 refs.]

This paper deals with the subject on similar lines to other communications by the same writer. It lays stress on the importance of not attempting to enforce segregation in backward tropical areas, lest more harm should result from concealment of the early amenable cases, which it is most important to attract to the hospitals and dispensaries for treatment, than good from the isolation of a small proportion of the advanced cases, in which stage most of the nerve forms are not infective.

A. G. B.

DELAMARE. **Infantilisme lépreux.**—*Rev. française d'Endocrinologie.* 1923. July. No. 3. [Reprinted in *Etudes & Notes (1923). Chaire de Médecine exotique de la Faculté de Constantinople.* pp. 24–32. [3 refs.]

The writer describes two cases of leprosy in which the frequently recorded infantile characters persisted. The first was a young man of 17 years, whose sexual powers were still undeveloped, with advanced nodular leprosy, including a nodule in one testicle. He presented other signs of ill-development, but none of the characters due to defective thyroid. Thyroid gland treatment had no effect on him; his mind, though somewhat childish, was not otherwise deficient. The other was a mixed case of leprosy in a boy of 14, who was ill-developed for his age, with very little pubic or axillary hair and testicles the size of cherries, but not showing any leprous nodules.

L. R.

EYCKMANS (Robert). **Léprose pulmonaire pure dans un cas de lèpre tuberculeuse.**—*Bruxelles-Méd.* 1925. Mar. 29. Vol. 5. No. 22. pp. 733–736.

The occurrence of true leprous lung lesions has long been disputed, and requires animal inoculations for its proof even post mortem; the author does not know of any case in which it was proved during life. [E. MUIR has reported one.] He relates a case in which numerous acid-fast bacilli were found in the sputum of a female leper aged 54, who contracted the disease while sister in charge of leper children, in whose room she slept, the disease developing into well-marked nodular leprosy. After six years' progress she developed signs of febrile bronchopneumonia, the sputum showing very numerous acid-fast bacilli and granules resembling those of leprosy, with which two guineapigs were inoculated; one died after 18 days with a local abscess containing no bacilli, but some cocci; the other had a small local abscess, but recovered, and on being killed three months later was healthy. The patient recovered from the lung complication and her skin lesions also improved for a time.

L. R.

HUDELO & KOURILSKY (R.). **Un cas de lèpre mutilante autochtone.**—*Bull. Soc. Française de Dermat. et Syph.* 1925. Mar. No. 3. pp. 102–106. (Discussion pp. 106–107.)

This case of advanced nerve leprosy with loss of digits was found at Cotignac (Var), in mid France, in a boy aged 13, whose elder sister aged 17 was also a nerve case of leprosy, both cases apparently having been infected in France in a manner not traced. Professor JEANSELME in the discussion suggested that a somewhat similar case may have been infected through the husband, who had lived in leprous countries although not apparently a leper himself; he was possibly a carrier.

L. R.

DELAMARE & DJÉMIL (Said). **Le calcanéum des lépreux.** [Société Anatomique 1923. June 30.]—*Etudes & Notes (1923). Chaire de Médicine exotique de la Faculté de Constantinople.* pp. 63-64.

Radiographic examination of eight lepers showed in several of them abnormalities in the os calcis, firstly, in the common form of patches of partial decalcification throwing lighter shadows, and secondly, as hypertrophy of the bone accompanied by partial decalcification.

L. R.

RODRIGUEZ (Jose). **Progress of Leprosy Treatment Work at Culion Leper Colony.**—*Jl. Philippine Islands Med. Assoc.* 1925. Feb. Vol. 5. No. 2. pp. 40–46.

This is the fourth six-monthly report on the treatment of advanced cases of leprosy at Culion up to March 31, 1924. Of 2,810 patients then under treatment 9·7 per cent. had become negative bacteriologically, 62 per cent. had improved, 15·6 per cent. were stationary, and 12·6 per cent. were worse, the 273 negatives not including 40 paroled or discharged during the past six months. From May 1921 to October 1924, 405 patients had become negative at Culion, doubtful cases being excluded, and about 300 more were considered to be negative by the treating physicians, but were being kept under further observation before discharge; remarkable results undreamed of in such advanced cases a decade ago. Table 1 summarizes the results of the last four reports and reveals progressively improved results.

TABLE 1.—GROSS RESULTS, ALL PROGRESS REPORTS.

Date of Progress Report.	Cases.	Improved.	Stationary.	Worse.
		Per cent.	Per cent.	Per cent.
September, 1922 ...	4,067	56·0	36·0	8·1
March, 1923	4,035	53·3	36·0	10·7
September, 1923 ...	3,252	63·6	23·9	12·5
March, 1924	2,810	71·7	15·6	12·6

The results of the different methods of administering the chaulmoogra oil derivatives are given in Table 2.

TABLE 2.—TOTAL IMPROVEMENT BY DRUGS.

Drugs.	Total treated	Improved.				Stationary.	Worse.
		Neg.	Mkd. & Mod.	Slight.	Total.		
Chaulmoogra ethyl esters, plain (C.E.)	161	14·3	26·1	21·6	62·0	21·1	16·8
Chaulmoogra ethyl esters with ½ per cent. iodine (C.E.I.) ...	158	9·1	44·7	23·7	77·3	11·9	10·8
Chaulmoogra ethyl esters with 10 per cent. creosote (C.E. Cr.)	423	12·0	41·6	19·6	73·2	13·9	12·7
Chaulmoogra ethyl esters with ½ per cent. iodine and 10 per cent. creosote (C.E. I.Cr.)	935	9·8	35·3	29·2	74·3	16·6	9·1
Mercado mixture ...	533	6·4	29·5	24·4	60·3	19·3	20·4
Total	2,810	9·7	37·0	25·0	71·7	15·6	12·6

The iodized ethyl esters continue to be best with 77·3 per cent. improved; the creosoted preparations are almost as good, and both are considerably better than the plain esters, which are much more irritating, or the Mercado chaulmoogra oil mixture intramuscularly, although the last is least irritating, and so preferable in cases complicated with nephritis. The plain esters are much more irritating than after the addition of iodine or creosote and have now been given up. The higher alcohol esters of chaulmoogra oil have been found to be less efficacious than the ethyl ones, and cod liver oil esters were too irritating. The dosages of the iodized esters advised is 2 to 5 cc. once a week intramuscularly, and creosoted esters or the Mercado mixture should be injected twice a week to get the best results.

Table 3 gives the results in cases of different duration; those under 5 or over 25 years show most improvement, the latter manifesting strong natural resistance.

TABLE 3.—DURATION OF DISEASE TO IMPROVEMENT.

Duration.	Cases.	Improved.	Stationary.	Worse or dead.
Years.		Per cent.	Per cent.	Per cent.
0 to 5 ...	1,156	75·6	12·6	11·8
5 to 10 ...	1,066	66·9	17·3	15·7
10 to 15 ...	453	67·1	18·5	14·3
15 to 20 ...	130	67·6	20·0	12·3
20 to 25 ...	47	76·6	14·9	8·5

Table 4 shows that the effects of treatment improved with its duration, up to 32 months, and then remained about stationary, the lower figure between 18 and 24 months being due to a large number of unfavourable cases included in the early period of the treatment.

TABLE 4.—TOTAL TIME TREATED TO IMPROVEMENT.

Total time treated.		Improved.	Stationary.	Worse.
Months.	Cases.	Per cent.	Per cent.	Per cent.
To 6 ...	24	29·2	58·3	12·5
6 to 21 ...	92	50·0	23·9	26·1
12 to 18 ...	314	70·6	17·5	11·8
18 to 24*a* ...	1,344	61·3	21·2	17·4
24 to 32 ...	749	85·4	8·3	6·3
32 to 35 ...	302	84·3	6·0	9·6

a This large group includes many unfavourable cases placed under treatment at the beginning of the present campaign.

Lepra reactions in the form of fever or the appearance of new crops of skin lesions are regarded as evidence of depressed bodily resistance, which are to be avoided as far as possible, for of 3,249 patients studied from this point of view 644, or about 25 per cent., had one or more lepra reactions, and only 30 per cent. improved, 42 per cent. were stationary, and 31 per cent. became worse, against 2,605 without such reactions, with 45 per cent. improved, 42 per cent. stationary, and only 13 per cent. worse. Complaints of various kinds were made by 43 per cent. of the patients, cough, pain in the chest and fever being usually an indication of tubercular complication, which occurred in 158, or 45 per cent. of the 350 cases who dropped out of the treatment clinics, other causes being nephritis in 61, or 18 per cent., protracted lepra reactions in 54, or 15 per cent., leprotic involvement of the eyes in 18, or 5 per cent., and other complications in 59, or 17 per cent.

L. R.

WADE (H. W.), LARA (C. B.) & NICOLAS (C.). **Complaints of Patients under Antileprosy Treatment. I. Nature and Frequency in Cases receiving Chaulmoogra Ethyl Ester Preparations.**—*Philippine Jl. Sci.* 1924. Dec. Vol. 25. No. 6. pp. 661–691. [1 ref.]

——. **II. Comparison of Plain Chaulmoogra Ethyl Esters and Two Iodized Preparations.**—*Ibid.* pp. 693–710. [1 ref.]

——. **III. Comparison of Creosoted and Non-Creosoted Chaulmoogra Ethyl Ester Preparations.**—*Ibid.* 1925. Jan. Vol. 26. No. 1. pp. 21–45. [7 refs.]

i. An analysis has been made of the complaints made by over two thousand patients under treatment at Culion. These influence the dosage, etc., especially in the advanced cases met with in segregation colonies, so are of great practical importance. They numbered from 63 to 79 per cent. in the two main clinics, and fall into five groups: (1) Includes immediate symptoms, namely, coughing and choking, in 4·9 per cent., and dizziness in 1·5 per cent., causing only temporary and not very important disturbances; (2) local effects in the form of inflammation in 21·3 per cent., nearly always in the form of induration, only nine abscesses having occurred, most of which were sterile; (3) includes general symptoms, such as headache, malaise and simple fever recorded in 6·0, 6·4 and 9·3 per cent. respectively;

(4) chest pain and oppression and cough were noted in 15·0 and 19·1 per cent. respectively and are important complaints: haemoptysis was very rare, in spite of phthisis being a common complication of leprosy; (5) comprised reaction symptoms, either lepra fever or cutaneous eruptions without fever, met with in 14·3 per cent., and even inflammation in another 2·8 per cent., while rheumatic pains were noted in 1·8 per cent. A 6th group is formed by symptoms of nephritis, but as these were not systematically sought their percentage cannot be given; albumen was often found in the urine. Complaints were equally frequent in the two sexes, and were commonest in the highest age group of over 60 years; they were fewer with the larger doses owing to the amounts being reduced in those complaining. The writers are doubtful whether it is advisable to produce leprous reactions or not, but are inclined to consider it unnecessary and perhaps harmful to do so.

ii. This paper contains a careful analysis of 2,818 cases of leprosy to determine the best way of giving the ethyl chaulmoograte as a routine method of treatment, either by itself or with 2 per cent. or 0·5 per cent. of iodine in addition. The results show that the plain ester is more irritating to the tissues at the site of injection and also to the respiratory tract than iodized esters, thus seriously limiting the intensiveness of the dosage, and that they also caused more general symptoms. Of the two strengths of iodine the latter has distinct advantages, allowing of the use of larger doses, while it has no disadvantages as compared with the plain esters; the addition of 0·5 per cent. iodine is therefore the method of choice. The writer notes that in Honolulu 4 per cent, iodine was originally used, but has now been reduced to 1 per cent.; this is closely in accordance with their independent conclusion, which may therefore be safely accepted.

iii. This paper presents a further careful analysis of the complaints in 2,214 cases under different treatments by plain ethyl chaulmoograte, and with the addition of 0·5 per cent. iodine, 10 per cent. creosote, or both respectively, the cases having an average duration of 8·3 years. It was found that the addition of creosote had a very similar effect to iodine in reducing the local irritation and enabling the dosage to be pushed to more effective amounts. The difference between the two is not material, but, if anything, is in favour of iodine; lung symptoms were more frequent with the creosote; the choice therefore depended on therapeutic results not yet determined. The addition of both drugs gave rather less favourable results, and is not recommended, and it may be advisable to reduce the amount of the creosote; MUIR now uses only 4 per cent.

L. R.

GAVINO (Catalino) & TIETZE (Samuel). **Results obtained from the Various Treatments of Leprosy at San Lazaro Hospital, 1920-1924.**—*Jl. Philippine Islands Med. Assoc.* 1925. Feb. Vol. 5. No. 2. pp. 50–61.

During the past four years the various newer treatments have been carried out in the lepers admitted to this hospital under difficulties due to frequent transfers to Culion, but with a larger proportion of early cases than in that colony. No negative cases were obtained in the first six months to the end of 1920, but during 1921, of 46 cases treated by ROGERS' methods (sodium gynocardate and sodium morrhuate) 9 had become negative, and of 366 on Dean's plain chaulmoogra esters 9 were negative, as well as 3 of 15 on Mercado's mixture. In 1922 iodized esters were used with the practical abolition of local abscesses, 20 negative cases resulting out of 444 patients, and 8 negatives of 34 treated by ROGERS' preparations; in 1924 iodized esters were nearly exclusively used with 72 negatives out of 503 treated. The main causes of 95 deaths in five years were lung disease, chiefly tuberculosis in 28, and kidney involvement in 13. From 1922 to 1924 82 patients were given certificates of parole, and 33 permanently joined the community as useful citizens, or 11 negative cases. They conclude :—

> " When one is acquainted with the results of antileprotic treatments of fifteen or twenty years ago and compares them with the present number of negatives, such favourable progress is almost unbelievable. To us, who had seen a negative case for the first time ten years ago, it seemed miraculous that patients could be rescued from a hopeless disease—could be taken from a 'living death' and allowed to enjoy the pleasures of this world."

L. R.

KEPPLER (A.). **Ueber Versuche mit subcutanen Chaulmoograöl- (aus** *Taraktogenos Kurzii*) **Injektionen.** [Experiments with Subcutaneous Injections of Chaulmoogra Oil (from *Taraktogenos kurzii*).]—*Klin. Woch.* 1925. Apr. 30. Vol. 4. No. 18. p. 879.

The experiments were made on dogs. For dilution various oils were chosen, partly with and partly without the addition of ether. While with other oils in the proportion 1 : 1 a clear solution could be obtained only by the addition of ether, arachis oil and chaulmoogra oil in the same proportion gave, without ether, a solution which at room temperature remained perfectly clear without any deposit after standing for several weeks on end. Omission of the ether renders the injections apparently quite painless to the animals. Injections of the dose quoted by HARPER for human beings, viz., 0·295 cc., administered at intervals of a week in various parts of the body had no effect whatever. The dogs retained their appetite and good digestion, and the urine remained free of albumin. Later, HARPER'S double dose was given every third day at the same site (gluteal region). This, likewise, was without effect. With the idea of obtaining sterility of the oil, further experiments were made with the addition of 3 per cent. phenol to the mixture of arachis and chaulmoogra oils. These injections were likewise borne without any signs of pain or traces of albumin in the urine. After a few days, however, small superficially necrosing parts formed at the site of the injection which were then smoothly shed. In view of this symptom and the always present danger of phenol poisoning with a long continued treatment, it seems advisable to omit the phenol.

L. R.

KITS VAN HEIJNINGEN (A.). **Thymol-inspuitingen bij Lepra.** [Thymol Injections in Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 932–933.

The author administered during 7 months injections of thymol in alcohol (twice per week, 2 cc. of a 10-40 per cent. solution), or thymol in anise oil (once only 4-8 cc. of a 60 per cent. solution). He did not see any clinical or bacteriological result from this treatment, but admits that the patients' subjective feelings have improved. He was not satisfied with it.

W. J. Bais.

HEINEMANN (H.). **Over behandeling der lepra met thymol.** [On the Thymol Treatment of Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 66–69. [2 refs.]

Heinemann used a preparation (Heyden 651a), containing 1 per cent. thymol in emulsion, for intravenous injections, every other day, beginning with 0·2 cc., 0·4 cc., 0·6 cc., and afterwards 0·8 cc., in which dose the medication is continued for a considerable time. The injections cause no pain. In 9 of a series of 12 patients treated there was a more or less noticeable improvement, but no real healing was established and in some cases relapses occurred.

W. J. Bais.

DELAMARE (G.). **Sur l'histoire de l'éparsénothérapie antilépreuse.**—*Progrès Méd.* 1925. Apr. 11. No. 15. pp. 535–538. With 1 chart in text. [14 refs.]

The writer summarizes the literature of this subject from the first roseate reports of the cure of leprosy in a few weeks of HASSON, of Alexandria, and of GOUGEROT (which were dealt with at the time in this *Bulletin*), and the favourable report of ROBINEAU at the Strasbourg conference, followed by unfavourable reports of MARCHOUX, JEANSELME and Delamare himself; and he shows by a chart that no successes have been reported since July, 1923, the earlier results being temporary improvement so often seen within a short time of using a new remedy, owing to insufficient allowance for the natural variations in the course of leprosy and especially marked improvement after a fresh exacerbation.

L. R.

DE SEQUEIRA (Luiz Artur Fontoura). **O antimónio no tratamento da lepra.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 375–383.

The author gives an account of the results he has obtained with the use of antimony in leprosy. He employs "Oscol Stibium" for intramuscular and, occasionally, intravenous administration, and tartar emetic in 2 per cent. solution for the latter only. He states that antimony tends to accumulate in the skin and mucous membranes and thereby prevents the elimination of bacilli from the ulcerated surfaces. He gives brief details of 12 patients to whom injections were given on alternate days, starting with 0·04 gm. in 2 cc., and increasing by 1 cc. per diem till 0·1 gm. was given. This dose was not exceeded and the course consisted of 12 injections. After an interval of a few days a second and even a third series was given. Though considerable improvement resulted the author does not claim that antimony in any of its present forms will effect a cure, but he looks forward to the time when chemists will evolve a more efficacious preparation and one better tolerated by the patient.

H. Harold Scott.

LEVY (D. M.). **Unna's behandelingswijze der lepra.** [Unna's Treatment of Lepra.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Mar. 28. 69th Year. 1st Half. No. 13. pp. 1422–1426.

The treatment is combined internal and external. The first consists of a chaulmoogra cure, the hydrolysed oil being taken in pills, containing 0·15 or (mitigated cure for very susceptible persons) 0·10 grams of the oil per pill—30 pills daily in 3 doses of 10 after each meal; it also includes a daily subcutaneous injection of "Durotan" (*i.e.*, a product of the esters of chaulmoogra oil, prepared by Beyersdorff, in Hamburg) in the morning, and an enema of 5 cc. oil in 50 grams of milk in the evening. For external treatment an ointment of yellow vaseline containing 5 per cent. pyrogallol, 5 per cent. ichthyol, and 2 per cent. salicylic acid is rubbed into the skin. This ointment acts as an irritant both to kidneys and skin and should therefore be applied with great care. Probably another ointment, Terpistrol, containing turpentine and said to have a specific action against the lepra bacilli, will prove, with further experience, to be more useful. (Some details are added as to local treatment of nodules of the skin, maculae and corneae, and cosmetic treatment of facial lesions.) The treatment is continued for two years in the hospital. The patients discharged are said to excrete no bacilli, to show no suspicious lesions of the mucosa, and to be in an excellent state of health. The internal treatment is continued at home for several years. Some patients show high fever and other reactions during this treatment. They undergo an unmixed ichthyol-cure (baths, pills, plasters).

N. H. Swellengrebel.

MONTERO (Aniceto). **La** *Bixa Orellana* **(Achiote) en el Tratamiento de la Lepra.**—*Rev. Méd. de Yucatan.* 1925. Feb. Vol. 13. No. 5. pp. 118–121. With 2 text figs.

The author has used preparations of Achiote, the common name for *Bixa orellana*, a plant closely allied to Chaulmoogra, for the treatment of leprosy. It is, however, somewhat poor in fats, various specimens yielding from 2·5 to 6 per cent. The dose used is not stated, but the author remarks that phagocytosis is stimulated at once, the bacteria disappear, and the clinical results are excellent; repeated examinations of the blood subsequently through a period of some years has failed to reveal bacteria and the disease has not recurred.

H. Harold Scott.

JACONO (I.). **L'albuminoreazione del muco nasale e l'autovaccino per la diagnosi precoce e la cura della lepra.**—*Riforma Med.* 1925. Feb. 2. Vol. 41. No. 5. p. 105.

This contribution consists of two distinct parts. In the first it is stated that although Hansen's bacillus cannot be found in some cases of leprosy in the nasal secretion albumen may be demonstrated. The author states that this sign is positive in 98 per cent. of nodular cases and in 86 per cent. of the anaesthetic. This does not quite harmonize with the succeeding sentence, in which it is said that if albumen is not present "leprosy can with certainty be excluded."

The second part is an adaptation to leprosy of the method previously recorded of treating lupus by a vaccine prepared from tuberculous glands. The author, having occasion to treat a patient of 70 years suffering from generalized leprosy, which had proved resistant to other forms of treatment, excised a nodule from the arm under as aseptic conditions as possible, cut it into fragments, and triturated it in a mortar with normal saline, heated it to 60° C. for half-an-hour, and diluted it with phenol. 1 cc. of the final emulsion contained, roughly, 200 million lepra bacilli, though accurate enumeration was not possible owing to the clumping of the organism. The initial dose was 0·1 cc., and this was increased according to the clinical state. After three injections at intervals of a week there was notable improvement both subjectively and objectively. The size of the doses after the first is not mentioned.

H. Harold Scott.

TEDESCO (P. Atzeni) & MAZZOLENIS (U.). **Prime ricerche di capillariscopia nella Lepra.**—*Giorn. di Clin. Med.* 1925. Apr. 10. Vol. 6. No. 5. pp. 175–182. With 6 coloured figs on 1 plate.

The authors describe the conditions of the capillary vessels and loops and the changes which take place in them in the skin of leprous patients, as seen by means of a special form of microscope, called a capillariscope, devised by MÜLLER of Tübingen. A plate of six coloured figures is given which demonstrates the various appearances as seen by them. The plate is more descriptive than the text.

H. Harold Scott.

FAJARDO (Joaquin). **El bacilo de Hansen se encuentra en las deposiciones de los leprosos.**—*Repert. Med. y Cirug.* Bogotá. 1924. Dec. Vol. 16. No. 3. (No. 183.) pp. 117–124.

The author examined the faeces of a considerable number of lepers and suspected lepers for Hansen's bacillus in direct smears and after the use of antiformin and of alcohol and ether. He found them in the typical " bundle of cigars " arrangement in 100 per cent. of severe nodular forms, in 80 per cent. of those with few nodules, in 25 per cent. of the nervous cases, and in the macular period in 4 out of 10 patients examined. He gives in detail three cases in which examination of the nasal secretion was negative. In two the bacilli were readily found in the faeces. The third showed very slight indications, and would have been certified as healthy. Faecal examination revealed a few isolated bacilli in the first smear, and it was not until nine had been stained and examined that the typical " packets " were discovered.

H. Harold Scott.

STEVENSON (W. D. H.). **Complement Deviation and Globulin Content in the Blood of the Lepers. Part I. The Wassermann Reaction given by Lepers' Sera.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 583–600. [1 ref.]

Some unpublished work done in Bombay in 1910–11 is recorded, the Hecht modification of the Wassermann test as used by FLEMING having been adopted, although its disadvantages are recognized; 10, 5 and 2½ per cent. antigen in normal saline was employed. 27 of

37 with the 10 per cent. solution gave completel[illegible]ive results, 18 of 35 with 5 per cent., and 7 of 33 with 2½ per cent. [illegible]th, nodular reacting better than anaesthetic cases, as others have found. The globulin content of lepers' sera was also tested by NOGUCHI's method in lepers denying a syphilitic history and the general average globulin content of lepers' bloods was found to be very high; much more so than with syphilitics.

L. R.

PINEDA (Eloy V.). [In English & Spanish.] **Differentiation of Micobacterium Leprae from the more common Acid-Fast Bacilli. Deferenciacion del micobacterium leprae de los bacilus acido resistentes mas comunes.**—*Jl. Philippine Islands Med. Assoc.* 1924. Oct. Vol. 4. No. 10. In English pp. 373–379. [4 refs.] In Spanish pp. 396–398.

In the Philippines segregation is only legal in leprosy cases proved positive by bacteriological examinations, which are thus of great importance. The writer recommends incising the lesions to a depth of two millimetres, after cleansing the skin with alcohol or gasoline, the latter for preference, and then scraping the side of the wound, and fixing and staining the slide for three minutes in cold carbol-fuchsin and counterstaining with Gabbet's blue. [In Calcutta small pieces of skin are cut out with a fine curved scissors and the under surface smeared on a clean glass slide.] When very numerous acid-fast thin bacilli, especially if in bundles, and red granules are found, they are certainly lepra bacilli, smegma bacilli being often shorter and thicker and granule forms absent, while tubercule bacilli are very scanty. The different degrees of staining properties are not reliable distinguishing points.

L. R.

i. ROGERS (Leonard). **The Treatment of Leprosy.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 772–790. [United Fruit Company, Boston, Mass.]

ii. BAUJEAN (R.). **Essais de traitement de la lèpre à la Martinique.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 90–97.

iii. DELAMARE (G.) & ACHITOUV. **Echec de l'éparséno dans une lèpre à Wassermann positif.**—*Bull. Acad. Méd.* 1925. Feb. 3. Year 89. 3rd Ser. Vol. 93. No. 5. pp. 141–145.

iv. CAWSTON (F. G.). **Antimony Treatment of Leprosy.** [Correspondence.]—*S. African Med. Rec.* 1925. Feb. 28. Vol. 23. No. 4. p. 87.

v. LAIGNEL-LAVASTINE. **Ostéopathies de morphologie lépreuse chez un tabétique. (Présentation du malade et des radiographies.)**—*Rev. Méd. et Hyg. Trop.* 1925. Mar.-Apr. Vol. 17. No. 2. pp. 64–72. With 5 text figs. [2 refs.]

i. Deals with the same material as the Croonian Lectures of 1924, already dealt with in this *Bulletin.*

ii. The writer records a trial of ethyl chaulmoogrates mainly in 20 lepers in Martinique with improvement of various degrees up to complete clearing up of the lesions. His results confirm those of other workers as to the value of the improved treatment.

iii. In this case of mixed nodular and nerve leprosy eparseno was pushed, so as to produce arsenical rash and other toxic symptoms, without in the least ameliorating the leprous condition.

iv. The writer quotes a letter from a missionary lady in Tanganyika stating that the ulcers in a number of lepers healed under the use of oscol stibium. No information is given as to how long the cases were under observation.

v. Perforating ulcer, with exfoliation of pieces of bone, and atrophy of the digital bones of the foot, as shown by X rays, in a tabetic patient are described; but the absence of anaesthesia or of leprous skin lesions allowed the latter disease to be excluded without difficulty.

L. R.

BANCIU (A.). **Sur la survivance de la réagine lépreuse injectée chez les animaux.**—*C. R. Soc. Biol.* 1925. Feb. 27. Vol. 92. No. 7. pp. 529–530.

——. **Sur les propriétés acquises par le sérum des lapins inoculés avec un produit lépreux.**—*Ibid.* p. 531.

DORE (S. E.). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.). 1925. Feb. Vol. 18. No. 4. pp. 30–31.

RIECKE (Heinz-Gerhard). **Ueber einen Fall von Lepra tuberosa mit besonderer Berücksichtigung der Histopathologie.** [A Case of Lepra Tuberosa with Special Reference to the Histopathology.]—*Arch. f. Dermat. u. Syph.* 1925. Feb. 9. Vol. 148. No. 2. pp. 448–453. With 3 text figs. [6 refs.]

BERIBERI.

ACTON (Hugh W.) & CHOPRA (R. N.). **The Problem of Epidemic Dropsy and Beriberi.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 1–18. With 8 graphs & 3 plates. [22 refs.]

The authors' proposition is that epidemic dropsy and beriberi are different clinical aspects of a syndrome caused by ingestion of toxins formed usually in damaged rice, but occasionally in dried fish, tinned provisions, etc. Clinically this syndrome may be compared with that of asthma, where a toxin of varied origination may cause extremes either of bronchial spasm or of bronchial turgescence. If the asthma analogy be pursued, then the factors here to be considered are the nature of the poisonous bases begotten in different rices (for there are numerous different varieties and grades of rice), the condition of the nerve-endings affected by these poisons, and the endocrine defence.

The nature of the poisons has been carefully studied by microscope and by pharmacological and bacteriological methods here fully described. Briefly, the poisons are most readily formed in rices which, after having been deprived of their vitality by parboiling and of most of their aleurone and other protectives by excessive milling, are then badly stored in a humid and warm atmosphere where they are attacked (particularly at the exposed and vacant site of the embryo) and damaged by fungi and bacteria, and particularly by a strongly proteolytic bacillus of the *vulgatus* group. Some of the toxins thus developed are water-soluble and affect the heart, besides producing bronchial constriction and swelling of a limb, experimentally; others are alcohol-soluble and have no effect on respiration or blood pressure, but are neurotoxic. The development of toxins in rice through the agency of fungi and bacteria is compared with the formation of ergotin in rye parasitized by the Claviceps fungus [but the comparison is not quite exact]. It is not quite explicitly emphasized, but it is clearly implied in the detailed account given of the different varieties and "grades" of rice, that the respective amounts of water-soluble and alcohol-soluble toxins differ in these different grades; so much so that those (damaged) grades in which water-soluble toxins predominate are termed "epidemic dropsy rice," and those in which alcohol-soluble predominate, "beriberi rice." Epidemic dropsy occurs among Bengalis, who are accustomed to eat medium grades of rice which are invariably parboiled and milled; also in Hindu widows, who consume the water, rich in the soluble toxins, in which rice has been boiled. The Chinese in Calcutta, who eat the harder, coarser grades of polished rice, are sufferers from beriberi.

Damaged rice can be recognized by its opacity, which is exaggerated if the grains be left for a few minutes in water; sections under the microscope show liquefaction and the existence of spores and bacilli in the starch granules. The bacilli have been cultivated by the authors and the poisonous rice-bases produced and studied in the laboratory, the alcohol-soluble poisons (neurotoxic) appearing only under anaerobic conditions, and when the temperature of the medium is raised to 50° C.

Individual susceptibility to these toxins of course exists, susceptibility being increased by hypo-adrenia (and to a less extent by hypo-thyroidism) as has been ascertained by experiment on animals.

The authors' attitude to the vitamine-deficiency theory of the diseases in question is not equivocal, but is expressed with vexatious ambiguity. They believe almost as heartily in vitamins as they do in rice toxins, and they surmise that the vitamins act either by stimulating endocrine secretion or by antagonizing the toxins, since they find by an experiment that rice-polishings contain bases antagonistic to the bases found in diseased rice.

As regards prevention of these diseases they indicate: (1) Detection of diseased rice, in areas affected, by the water test used by rice-merchants, *i.e.*, appearance of opacity when the suspected grains are soaked in water for a few minutes; (2) proper preservation and storage; (3) careful washing of rice before use, to get rid of at least the water-soluble toxins. For curative treatment: (1) Changing the rice; (2) small doses of adrenalin, intramuscularâ, to diminish cell permeability and to antagonize the water-soluble toxins.

[The authors' conclusions, while affording a compact or comity between the theory of BRADDON and that of vitamine-deficiency, have the merit of explaining a lot of clinical incongruities and inconsistencies with all previous theories, and, beyond all that, the merit of being open to the final test of confirmation, or otherwise, by experiment in the laboratory.]

A. Alcock.

DUTT (Kartic Ch.). **Epidemic Dropsy.**—*Indian Med. Rec.* 1924. July, Aug., Sept., Oct. & Dec. Vol. 44. Nos. 7, 8, 9, 10 & 12. pp. 198–201; 237–242; 259–265; 299–302; & 362–364. •

This paper is based mainly on observation of 1,700 cases of epidemic dropsy. It contains some excellently discriminative clinical classifications of the disease and some ingenious argument relative to its causation.

The author does not accept either the food deficiency or the food toxin theory. In his own experience neither the use nor disuse either of polished rice or of any description of mustard oil has had any effect upon either the incidence or the treatment of the disease; moreover, in all the recent epidemics in Bengal, villages have suffered where the people decorticate their own rice, as daily required, by their own ancestral domestic methods, and among such sufferers he knows of a well-to-do family whose diet included plenty of fresh fish and fresh vegetables.

On the other hand, he believes the disease to be a malady quite distinct from beriberi, and to be a manifestation of intestinal sepsis dependent on the presence of a specific microbe, for the following reasons: (1) Throughout its course there is a leucocytosis which diminishes during convalescence and ceases on recovery; (2) a Dr. CHAKRAVARTY was infected in the act of operating upon a sufferer from the disease (although Colonel MEGAW, who inoculated himself with 3 cc. of serum from another patient, observed no reaction); (3) the disease is immediately checked and ultimately cured by a powerful antiseptic in the form of colloidal gold solution in nascent chlorine [susceptibility to direct attack by antiseptics has not so far been the story in conditions of generalized sepsis].

The peculiar susceptibility of Bengalis—even among a mixed population outside the limits of Bengal—which tells so strongly against the infection theory, is easily explained by the author. Mainly as the result of a spurious bookish education, of recent introduction, the modern Bengali has so degenerated from the immemorial standards of his stalwart ancestors that he can no longer resist even this particularly feeble microbe.

A. A.

BLACKLOCK (B.), PEACOCK (W. H.) & WOOD (John Y.). **Appendix V. Investigation into the Health of Prisoners in Freetown Gaol.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* pp. 55–61.

The seasonal appearance of beriberi is shown in the following table :—

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1922 ...	—	—	—	—	—	1	1	2	8	26	7	14
1923 ...	5	3	2	1	4	2	1	—	—	—	—	—

The disease disappeared in 1923 just at the period when it normally begins to increase. The largest percentage of deaths (3 out of 59 cases) occurred in those who had been in the prison between 7 and 12 months. 834 men were in for short sentences, under six months, a period too short for definite symptoms to appear. It was shown that the incidence of disease (mostly beriberi) and the death rate were higher among convicts than among the gaol prisoners, falling most heavily, as previously reported, on those of sedentary occupations, particularly tailors. The prophylactic measures recommended in 1922 appear to have been effective.

P. W. Bassett-Smith.

NORMET (M.). **Une épidémie de béribéri dans un bataillon Malgache à Granville.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 896–898.

An epidemic of beriberi occurred in the detachment of the regiment while at Granville during September, 1924. After a few isolated undiagnosed cases there were, on September 20th, 93 cases, of which 6 were severe and 3 died; the epidemic ended in the middle of November, having affected 118 persons. It was traced to a defective diet, for when this was modified (the rice being suppressed and bread given in its place) there was a rapid diminution of the cases. The author finds it difficult to attribute the epidemic to a deficiency of vitamin B.

P. W. B-S.

HOFMANN (J. Allen). **Beriberi in Chinese Women and its Relation to Childbearing.**—*China Med. Jl.* 1924. Dec. Vol. 38. No. 12. pp. 987–993.

Experience during the past few years had led the author to believe that beriberi is more frequent during the child-bearing period than at other times, and is especially serious when it develops during pregnancy. 38 cases were recorded in two years, all in residents of Canton; 21 were among the poor, 7 from the middle class, and 3 among the wealthy; 68 per cent. were between the ages of 21 and 35. The observations favoured the view that rice deteriorated from long storage was a cause and that wet seasons were an important factor. Many of the cases showed an acute onset, which is unusual in deficiency diseases. The gastro-intestinal symptoms were attributed to a duodenitis.

P. W. B-S.

RIDLEY (H. W.). **Use of Iodine in Beriberi.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 2. Vol. 28. No. 5. pp. 102–103.

To avoid losing his employees in the Singapore Botanical Gardens, the author took their treatment upon himself, as far as possible, often with the assistance of the local doctor. A number of mild cases of beriberi were generally present, mostly men who had been in the gardens more than three months before the annual outbreak; the children and women were not affected. Destruction of the "infected" houses and replacement did not prevent fresh cases. Sanitation beneath the houses was enforced. Having been told that the Dutch found iodine internally most efficacious, he gave 5 minims in water. It is stated that in ordinary cases one dose on three days was curative; great relief was given even when the heart was affected. Only two cases died, and this when he was on leave. The treatment was always used, but no statistics are given.

P. W. B-S.

FUNK (Casimir), COLLAZO (Juan Antonio) & KACZMAREK (Joseph). **Composition du régime et vitamine B.**—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 997–998.

This work is in support of the previous contention that vitamin B plays an important part in the utilization of carbohydrates, which has been doubted by some. Four groups of pigeons, 4 in each, were kept on a diet containing 1·5 per cent. of white of egg, starch and necessary salts. They received varying quantities of vitamin B to establish a constant weight. The initial food was replaced by others containing 25, 50, and 75 per cent. of white of egg. The results showed that the augmentation of the protein content had a favourable influence upon the weight of the bird, and increase of starch had the contrary effect. It is concluded that the exchange of protein necessitates a less quantity of vitamin B than exchange of carbohydrates, or, a definite quantity of vitamin B allows an animal to utilize more of a ration rich in proteins than one in which starch is abundant.

P. W. B-S.

BERNARD (P. Noël). **Avitaminose et infection dans la maladie expérimentale du porcelet due à** *Bacillus asthenogenes.* **(Recherches sur le béribéri.)**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 65–76.

The experiments and deductions previously reported are again brought forward and developed by the author; a discussion took place in which M. WOLLMAN and GUÉRIN spoke.

According to the author, that the disease is due to fermentation and not to vitamin B deficiency is shown by the fact that when whole rice heated so as to destroy the vitamin is used there is no disease in the piglets, but the disease develops when polished rice alone is given. To WOLLMAN it is not certain that the heating in the experiments had been sufficient to destroy all the vitamins, for it is unlikely that the animals would be quite unaffected upon a vitamin B free diet. This view was contested by GUÉRIN, who had been a collaborator with Bernard and had tested the temperature in bulk; he showed that the whole mass became heated to 135° C. and the claim of Bernard was justified.

P. W. B-S.

BERNARD (P. Noël) & BABLET (J). **Lésions histologiques des organes dans le bériberi humain.**—*C.R. Soc. Biol.* 1925. Mar. 7. Vol. 92. No. 8. pp. 600–602.

On the assumption that the *B. asthenogenes* produces a condition of beriberi in animals the authors sought to determine if the pathological lesions of human beriberi were similar to those of experimental animals. The material was taken from six acute and from four chronic cases that died in acute crises. They note punctiform haemorrhages and lymphocytic infiltration in the stomach and duodenum, congestion and hypertrophy of liver and spleen, inflammatory lesions of the kidney and suprarenal capsules with haemorrhages, the lesions indicating the irritative action of some toxic substances. [These changes are very similar to those found by HAMILTON WRIGHT, but the present authors do not record any changes in the cerebrospinal system or nerves.]

P. W. B-S.

BERNARD (P. Noël) & BABLET (J.). **Lésions histologiques des organes dans le bériberi infectieux expérimental du à** *B. asthenogenes.*—*C. R. Soc. Biol* 1925. Mar. 13. Vol. 92. No. 9. pp. 668–670.

Three methods of infection were employed: (1) Ingestion of infective germs by piglets; (2) intraperitoneal or subcutaneous injection of piglets, which died or were killed; (3) the intravenous injection of toxin into rabbits, which died in less than three hours. The resulting lesions were identical in all; death was therefore considered to be due to intoxication, but the lesions in the stomach and duodenum were more marked after the injection of the toxin than in the feeding experiments. The pathological changes found show a striking analogy between the human beriberi and the experimental infective beriberi due to *B. asthenogenes.*

The pure toxin of *B. asthenogenes* produces the same lesions as found in the experimental disease of gastro-intestinal origin due to the infective germ.

P. W. B-S.

PETRI (Else). **Histologische und histochemische Befunde bei experimenteller Beriberi.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 253. No. 1/2. pp. 147–156. [26 refs.]

The observations were made upon the organs and tissues of rats, mice, and fowls, in which beriberi was experimentally induced. Many efforts have been made to demonstrate histological and pathological changes specific to the disease without much success. The author's rats and mice were divided into three groups: (1) Some with typical beriberi; (2) some with the chronic form; (3) mixed material from Prof. HOFMEISTER. Previous observations were to a large extent verified, except that evidence of fatty degeneration of the heart muscle, kidney and liver was rare. In the suprarenals the neutral fats were within physiological limits.. The observations on the hypertrophy of the suprarenal of hens did not confirm those of OGATA in rice disease of birds. From the whole series of experiments the author concludes that there were no regular pathological features, and the changes found are not specific but occur in all cases of disease due to insufficiency and malnutrition.

P. W. B-S.

Bernard (P. Noël). **Action pathogène de** *Bacillus asthenogenes.—C. R. Soc. Biol.* 1924. Dec. 12. Vol. 91. No. 35. pp. 1245–1246.

This contains nothing new. The author states that the results need to be interpreted with great circumspection in the study of beriberi, but suggests the possibility of the rôle of *B. asthenogenes* in the evolution of the disease.

P. W. B-S.

i. Kobayashi (Yoshiwo). [**On the Results of Water and Condensation Experiments in Edematous Beriberi and on Water Intermediate Metabolism.**]—*Nissin Igaku* (*Progress in Med.*). 1924. Sept. Vol. 14. No. 1. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12 pp. 331–332.]

ii. Matsumoto (Shigewo). [**Blood Features in Human Case of Polished Rice Disease.**]—*Keio Igaku* (*Jl. of Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* p. 335.]

iii. Ito (Hisayoshi). [**On Vitamin B Contents of the Organs of the Rabbit fed with Various Different Rations with a Contribution to the Knowledge of Beriberi-like Disease of the Rabbit.**]—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. May. Vol. 23. No. 5. [*J. M. W.* Vol. 4. No. 11. p. 294.]

iv. Toguchi (Katsuta), Okamoto (Kyotaro), Hiraishi (Teiichi), Ohta (Kenichiro) & Kwa (Fuki). [**On Experimental B-Avitaminosis on Human Body.**] -*Keio Igaku* (*Jl. of Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* Vol. 4. No. 12. p. 335.]

v. Shibata (Yasaburo). [**Observations on Vitamin B Deficiency in the Dog, with Special Reference to the Changes in the Gastric Juice.**]—*Igaku Chuo Zasshi* (*Central Jl. of Med.*). 1924. Aug. Vol. 22. No. 3. [*J. M. W.* p. 330.]

vi. Tagawa (Zentaro), Hara (Katsumi) & Ohmori (Seiichi). [**Contributions to the Knowledge of Beriberi.**]—*Okayama Igakkwai Zasshi* (*Jl. of Okayama Med. Soc.*). 1924. Aug. No. 415. [*J. M. W.* p. 338.]

vii. Shimazono (Junjiro). [**Comparison of Beriberi and B-Avitaminosis.**] —*Kyoto Igakkwai Zasshi* (*Jl. of Kyoto Med. Soc.*). 1924. July. Vol. 21. No. 7. [*J. M. W.* p. 336.]

viii. Fukui (Shinritsu). [**On the Respiratory Oscillation of Intra-Rectal Pressure of the Cases of Beriberi and other Diseases.**]—*Chugwai Iji-Shimpo.* (*Internat. Med. Jl.*). 1924. Sept. Vol. 43. No. 17. [*J. M. W.* pp. 328–329.]

ix. Kozawa (Shyuzo), Kusunoki (Michiwo) & Hosoya (Nohfu). [**On the Vitamin B Contents of the Beriberic Urine.**]—*Iji Shimbun* (*Med. News.*). 1924. Dec. No. 1153. [*J. M. W.* 1925. Vol. 5. No. 2. p. 40.]

x. Takakusu (Ryochyo). [**On the Saccharification of the Urine of Beriberic Cases.**]—*Iji Shimbun* (*Med. News*). 1924. Aug. No. 1146. [*J. M. W.* Vol. 4. No. 12. p. 329.]

xi. Ohta (Kenichiro). [**Urine Analysis and Metabolism in Human Experimental B-Avitaminosis.**]—*Keio Igaku* (*Jl. Keio Med. Soc.*). 1924. July. Vol. 4. No. 7. [*J. M. W.* p. 335.]

xii. Ijiri (Matagoro). [**On the Therapeutic Action of Strychnin Hydrochlorate with Special Reference to its Action against Perceptive and Motorial Disturbances in Beriberi.**]—*Chugai Iji Shimpo.* (*Central Med. Jl.*). 1924. Nov. Vol. 43. Nos. 21 & 22. [*J. M. W.* 1925. Vol. 5. No. 2. pp. 37–38.]

i. No definite changes were observed. The urine condensation carried out by the kidney was normal, as also was the excretory function.

ii. The blood experiments in human experimental "polished rice disease" never showed hyperglycaemia, acidosis, or decrease in lymphocytes, but rather an increase of the latter cells.

iii. Animals were fed upon foods containing different amounts of vitamin B, and the organs were tested quantitatively for the vitamin. It is concluded that in hyper- and hypo-vitaminosis the equilibrium of acid and alkali in the body was good, but in beriberi-like disease there was a marked acidosis.

iv. From the authors' experiments with a number of robust young persons fed upon vitamin B deficient diet they conclude that polished rice disease does not completely agree in its symptoms with beriberi. Various forms of derangement of nutrition appear to be caused by lack of B vitamin.

v. Shibata observed a quantitative decrease of HCl content in the gastric juice of the experimental dogs, which was independent of the anaemic condition of the animals.

vi. The authors found that there was an increased bilirubin excretion in the urine of a large percentage of cases of cardiac-oedematous forms of beriberi.

vii. Shimazono states that, clinically, cases of beriberi and experimental human B avitaminosis resemble one another closely, except that in the latter there is loss of appetite and less disturbance of the circulatory system. The relations of the two are similar to those of Basedow's disease and experimental hyperthyroidism.

viii. Fukui found that the respiratory oscillation of the intrarectal pressure in beriberi cases was less marked than in the normal or in other diseases than beriberi.

ix. Using Van der WALLE's method, the authors found that the polished rice disease of pigeons was not relieved by the administration of the component parts of urine of cardiac beriberi cases, but was relieved by those of normal urine. This might mean that the former was deficient in vitamin B, whereas it was present in the latter.

x. Takakusa states that the saccharification(?) of the urine of beriberi cases, especially when severe, was markedly reduced—even to one-half or one-third of that found in normal urine.

xi. Ohta carried out numerous tests from cases of various forms of B. avitaminosis which he divides into four groups, but no definite conclusions are given.

xii. It is stated that strychnine relieves incomplete paralysis, but has no action when it is complete. In beriberi it had the power to relieve disturbances of perception and motion. The sensory nerves were more quickly affected than the motor. The deduction is that other substances than vitamins can be employed for cure in beriberi.

P. W. B-S.

DUTT (Kartick Chunder). **Prognosis of Epidemic Dropsy.** (Bengal Beri-Beri.)—*Indian Med. Rec.* 1925. Mar. Vol. 45. No. 3. pp. 77–78.

SCURVY.

SCHAGAN (B.). **Zur Klinik des Skorbutes im Kindesalter.** [Scurvy in Children.]—*Jahrbuch f. Kinderheilk.* 1924. Feb. Vol. 104. No. 3/4. pp. 225-238. [7 refs.]

This is a very interesting paper with many tables analysing the results of a study of 186 cases of scurvy in children. The incidence was highest between the sixth and eighth year, the prognosis better for girls than boys and during the summer than in the autumn. Twenty out of 30 fatal cases were studied on the post-mortem table; they showed a very high percentage of pulmonary complications (30 per cent.) coming next to subperiosteal haemorrhages (40 per cent.). The lack of vitamin C is looked upon as the etiological factor, but the constitution of the patient determines the course and severity of the disease. It generally takes the character of a severe toxic condition with many organic changes causing a high mortality. It tends to make a pre-existing tubercular infection in children more active. The study of the blood and X-ray examinations point to severe disease of the bone marrow. There is not the physiological gain in weight of the normal child and the renal efficiency is reduced. Protein therapy by serum, milk, etc., failed entirely, and up to the present there is no specific therapeutic treatment. Dietetic treatment with vegetables and raw milk rich in C factor gave good results in many cases; 1 per cent. copper sulphate was the best application to the diseased mucous membranes.

P. W. Bassett-Smith.

STILL (G. F.). **The Treatment of Infantile Scurvy.**—*Proc. Roy. Soc. Med.* (Sect. of Therapeutics & Pharmacol.) 1925. Apr. Vol. 18. No. 6. pp. 9–15.

This paper from a practical teacher of great experience in the scurvy and prescurvy condition of infants is of much interest. The author very truly states that the vitamin theory has done little so far to help, for it has long been recognized that particular fruits and foods are essential in treatment and prevention, and BARLOW gave very definite instructions with regard to their use both for prevention and cure. He roundly condemns most patent foods and preparations, and points out how little antiscorbutic there is even in unboiled cow's milk. He finds "potato cream" to be one of the best antiscorbutics for infants; lemon juice, orange juice, and tomato juice are all, however, very good, but are inclined in certain cases to set up diarrhoea, a very undesirable complication. He acknowledges the work done by biochemists, particularly ZILVA, in decitrating the juice and then concentrating, thus making it less irritating to the bowel. "Dried milk is not protective against infant scurvy, but it is far less likely to cause scurvy than any of the patent foods." He points out that the infants themselves may vary much in their reaction to antiscorbutics; what is good for one is not for another; and that the more exact results obtained with guineapigs do not "come off" in the infants. Often, however, the failure is due to insufficient dosage or supply of the vitamin C. Very definite directions are given which should be of great value to the clinician.

P. W. B-S.

SSOKOLOFF (N. A.). **Ueber Cholesterinämie beim Skorbut.**—*Deut. Arch. f. Klin. Med.* 1924. Oct. Vol. 145. No. 3/4. pp. 236–239. [2 refs.]

The author examined the blood of 23 cases of scurvy divided into three groups: (1) Severe cases under good conditions; in these there was a great reduction of the cholesterin content of the blood. (2) Severe cases which were ill-nourished and under bad hygienic conditions; in these the fall was more marked, even to half the normal. (3) Convalescent cases; in these the amount gradually rose to normal. The low percentage had no direct relationship to the amount of fever or loss of weight, but was thought to be due to toxic agents. The cholesterin content was always reduced in scurvy blood and in proportion to the severity of the case; this low content must not be looked upon as an etiological factor, but rather as a result of the disease.

P. W. B-S.

ZILVA (S. S.). **Recent Progress in the Study of Experimental Scurvy.**—*Proc. Roy. Soc. Med.* (Sect. of Therapeutics & Pharmacol.). 1925. Apr. Vol. 18. No. 6. pp. 1–9. With 6 charts.

Previous experimental work on the etiology of scrvy and the effects of storage on antiscorbutic preparations is reviewed. The effects of oxidation, the aerobic and anaerobic preservation of vegetable juices (fruits and roots) are shown by experimental curves, and the methods employed by the author to obtain the active factor in greatest purity possible are described, viz., by removing acids and sugars and finally precipitating with lead acetate. There remains a very active fraction which contains very little nitrogen and merely traces of phosphorus, decolorizes pot. permang. and reduces ammoniacal silver nitrate in the cold. Diffusion experiments show that membranes which pass small molecules, such as sod. chloride, retain the antiscorbutic factor during a period of 3-4 days of dialysis. Those membranes that pass semicolloids, such as neutral red, allow the antiscorbutic factor to dialyse. Therefore, the antiscorbutic factor is not associated with the sugar and probably is not derived from the nitrogenous fraction of the juice.

P. W. B-S.

MOURIQUAND (G.), LEULIER (A.) & MICHEL (P.). **Fluctuations du fer sanguin au cours du scorbut expérimental.**—*C. R. Acad. Sci.* 1925. Jan. 5. Vol. 180. No. 1. pp. 86–88.

The known pathological changes of the blood in scurvy led to a chemical examination in experimental animals and attention was concentrated upon the iron content. The results obtained in different periods of the disease were both definite and interesting. There was little change from the normal up to the 24th day; the iron content then became constantly lowered and appeared to run parallel with that of the haematin. The cause of the changes, anaemia, etc., was recognized by the authors in the haemorrhages that take place and in all cases the fall followed the development of the scurvy symptoms; with the cure of the disease it disappears.

P. W. B-S.

i. MOURIQUAND (G.), LEULIER (A.) & MICHEL (P.). **Avitaminose C et glycémie.**—*C.R. Soc. Biol.* 1925. Feb. 6. Vol. 92. No. 4. pp. 271–273. [1 ref.]

ii. — -, — -, & ——. **Dosage du phosphore et de la chaux du tissu osseux et des dents des animaux soumis à l'avitaminose C.**—*Ibid.* pp. 269–271.

i. In previous experiments with avitaminosis in guineapigs the authors showed that there was a marked reduction of iron in the blood after the 24th day. Fresh experiments were made to determine whether there was any change in the amount of blood sugar. Six animals and six controls were used. The ratio in the blood remained remarkably constant and in acute conditions of vitamin C deficiency of guineapigs there was no evidence of abnormality, the tests and controls agreeing closely throughout.

ii. In this series of experiments, made to determine the changes in the bones, etc., of animals under conditions of vitamin C deficiency, it was shown that, contrary to the anatomical and chemical evidences, there was neither decalcification nor dephosphorization of the bones in scurvy guineapigs, even when the fragility of the bones was very marked. The cause of this fragility has still to be discovered, and further research on this point is being carried out.

P. W. B-S.

BEZSSONOFF (N.). **Quelques données sur la nature du principe antiscorbutique dit Vitamine C.**—*C. R. Acad. Sci.* 1925. Mar. 23. Vol. 180. No. 12. pp. 970–972. [3 refs.]

This paper is highly technical. By a process of oxidation the author was able to obtain from fresh cabbage juice a crystalline substance in alcohol and acetone. This product protected guineapigs from scurvy when given in quantities of less than 2 mgm. It is a hydrocarbon belonging to the orthodiphenol group. The oxidation of this gives a quinone which seems to be " phenol anthracénique."

P. W. B-S.

DELF (Ellen Marion). **The Influence of Storage on the Antiscurvy Value of Fruits and Vegetable Juices.**—*Biochem. Jl.* 1925. Vol. 19. No. 1. pp. 141–152. With 2 figs. [12 refs.]

The present work is a continuation of that started in 1918 by DAVEY and others, in part at the Lister Institute. For the experiments young guineapigs were used (350 gms.), the fruit juice was fresh and the period of observation 90 days. No attempts were made during the storage to exclude air so that considerable oxidation would have taken place. The following conclusions are given :—

" 1. When whole fruits (oranges or lemons) or tuberous roots (swedes) are stored, their antiscorbutic value is retained as long as the tissue itself remains living.

" 2. The expressed juice of oranges and lemons stored for five years in the frozen condition retains about half its original antiscorbutic potency. Swede juice on the other hand stored in a similar way, loses the greater part of its value in less than two years. It is suggested that the greater deterioration in the latter case may be due to the lower acidity or to autoxidation or to both.

"3. Canned orange and tomato juice retain much of their value even after storage for four years at laboratory temperature. The tomato, as prepared for these experiments, was much less stable than the orange.

"4. Lemon juice, with added potassium bisulphite, retains its flavour well after storage for 4½ years at laboratory temperature. At this age, the protective dose of lemon juice containing ·06 per cent. sulphite was about 10 cc. instead of the original 1·5 cc., thus indicating a loss of about five-sixths of the original value.

"5. Both orange and lemon juice can be preserved satisfactorily for one to three years at laboratory temperature in presence of their own rind oil.

"6. Inspection of the comparative curves in fig. 1 shows the relative stability of the juices examined. Canned orange is the most stable, and this is in agreement with previous findings with heated juices [Delf, 1920]. The frozen juices are next in order of stability; the form of the curves in preserved juices suggests that the added sulphite has a destructive effect on the stability of the antiscorbutic vitamin."

P. W. B-S.

MACKLIN (A. H.). **Lime Juice and Lemon Juice for Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Apr. 4. p. 680.

From practical experience in the war and in Polar regions Macklin draws attention to the frequency of prescurvy conditions, and states that the lemon juice supplied, though effective, was not easily portable. He suggests that much further use might be made of the "tablet" method of BASSETT-SMITH, "the value of which cannot be doubted for use in military campaigns, or where relief is required for destitute populations, or for cruises such as that of the *Discovery*." The trouble is to get these concentrated preparations manufactured by firms. He states that their adoption by the Admiralty or War Office would benefit not only members of the Services, but many outside.

[There is no doubt that concentrated forms of lemon juice in a portable form would have a great field of usefulness both in the Service and mercantile marine, and also among children (STILL, page 589).]

P. W. B-S.

BASSETT-SMITH (P. W.). **Lime Juice and Lemon Juice for Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Feb. 21. p. 385.

This story has been told in the *Bulletin* before, but bears retelling. Following the treatise of LIND (1754), BLANE, in 1796, caused lemon juice to be established as an essential part of the naval dietary; with the result that scurvy was practically abolished. About 1860, for an unknown reason, West Indian limes were substituted for Spanish lemons, with disastrous consequences to NARES's expedition (1875). Recent work proves abundantly the superiority of lemon to lime juice. The writer, to provide a portable substitute for lime juice, evaporated lemon juice *in vacuo* and made tablets each containing the equivalent of half a lemon; these were protective to guineapigs after a year's storage. We may with confidence apply the use of concentrated lemon juice to man under conditions of service which preclude the regular provision of fresh fruit, such as in the Persian Gulf and in high latitudes. For general service on a large scale the unheated concentrated syrup may be kept in bottles and the equivalent of 24 cc. of fresh lemon juice given to each man with sugar in water. Such syrup keeps well, being immune from mould. The reason for the letter appears in the last sentence where we learn that the Admiralty still issues lime juice "as an agreeable beverage," but supplies no anti-scorbutic capable of replacing lemon juice.

A. G. B.

Hara (Saburo). [**Experimental Studies on C-avitaminosis.**]—*Chugai Iji Shimpo.* (*Central Med. Jl.*). 1924. Oct. Vol. 43. No. 20. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 37.]

In his experiments with vitamin C deficiency diets the author did not find any definite sign in mice and pigeons; in 10 per cent. of the rats there were slight evidences. In guineapigs there were marked signs which he divides into three stages. In the first two stages the administration of vitamin C caused an almost instantaneous cure; in the third stage it was not effective.

P. W. B-S.

Gittings (F. C. B.). **Lime Juice and Lemon Juice for the Prevention of Scurvy.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 7. p. 483.

REVIEWS AND NOTICES.

McCarrison (Robert) [C.I.E., M.D., I.M.S., in Charge of Deficiency Diseases Inquiry, Indian Res. Fund Assoc., Pasteur Inst., Coonoor] & Norris (Roland V.) [D.Sc., Agric. Chemist to Madras Govt., Agric. College, Coimbatore.] **The Relationship of Rice to Beri-Beri in India.**—*Indian Med. Res. Memoirs. Supplementary Series to the Indian Jl. Med. Res.* 1924. Oct. Memoir No. 2. pp. 1-87. With 3 maps and 6 charts in text. [29 refs.]

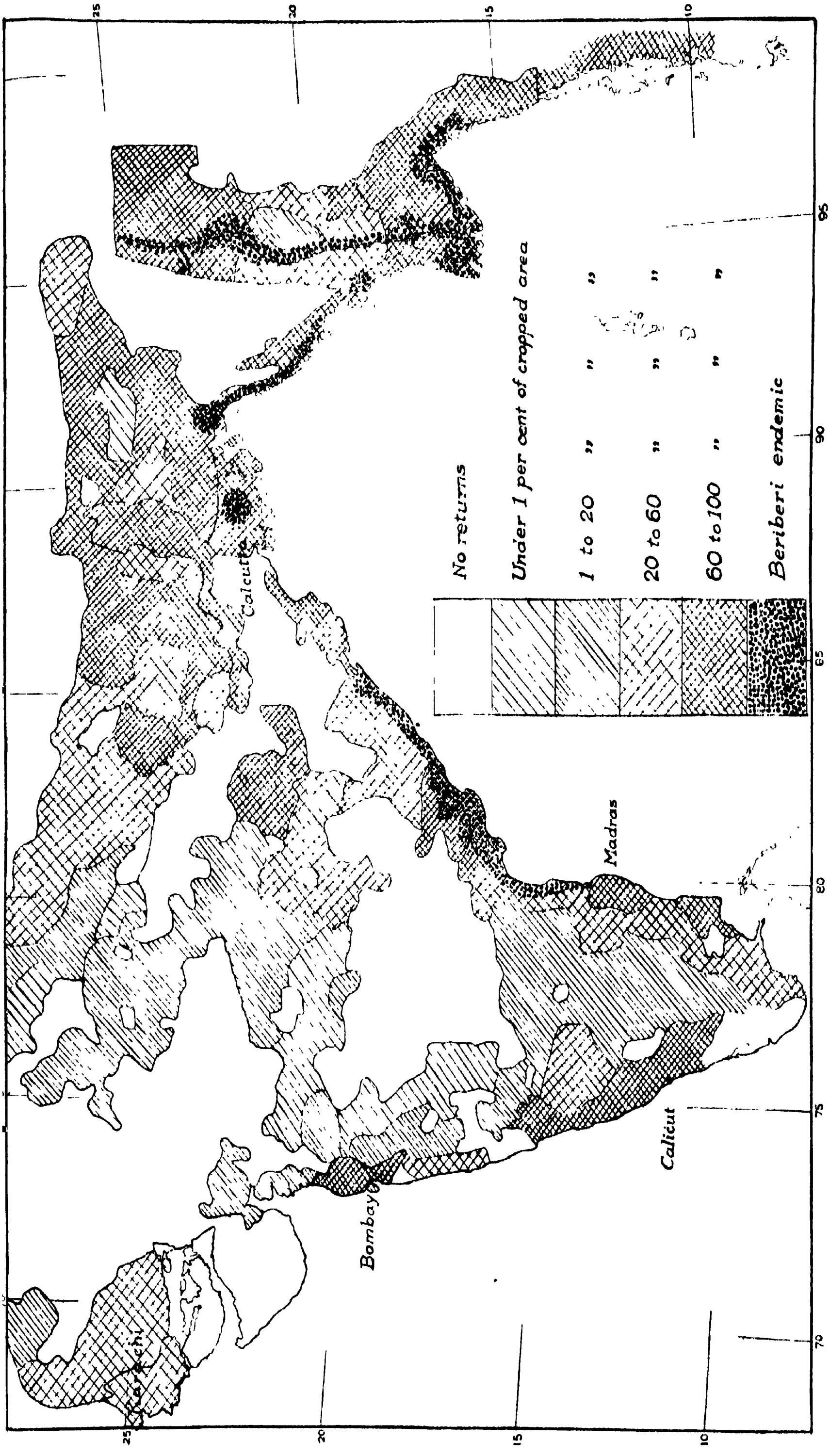
The basal idea of this memoir is to indicate " the extent to which present-day views in regard to the association of endemic or true tropical beriberi with the too exclusive use of a rice diet require modification in so far as India is concerned." That such an enquiry is needed is obvious when it is remembered that though decorticated rice is practically the staple diet of many millions in India beriberi is endemic only in a few circumscribed areas of Bengal and Assam, the north-east coast of Madras, the coast of Burma and the valleys of the Irrawaddy and Salween rivers. The question, too, is of more than academic interest, since suggestions have been made as to the advisability of legislation dealing with the over-milling of rice.

The work falls almost naturally into four sections, and the results can best be appreciated when thus considered. Under section I a full account of the milling of rice is given, and comparisons are made between the methods obtaining in beriberi and non beriberi areas. Many factors are discussed, such as the storing of rice, the use of other vitamin foods in the diet, the value of food-grains other than rice grown in endemic areas of the disease, etc. The result of these investigations seems to show that " unknown factors, peculiar to, or more potent in, endemic areas of beriberi appear to possess an important significance in regard to the genesis of this disease."

Section II deals with the source, variety and description of the paddy and rice investigated, samples of which were taken from two areas, viz., the Kistna district, where beriberi is very prevalent, and the Tanjore district, where the disease is not present. These districts are both formed by the deltas of great rivers and, moreover, have different rice-milling methods.

Experimental investigations with the samples of rice just described constitute section III of the memoir. It is impossible even to mention the 22 results given in the summary. Perhaps the fact that pigeons fed exclusively on Indian rice are liable to suffer from one of three different kinds of polyneuritis is worthy of special note. 1. *Polyneuritis Columbarum,* due solely to vitamin B deficiency. 2. *Beriberi Columbarum,* due to insufficiency, but not complete lack, of vitamin B, together with the presence of an unknown substance having a specific action on the heart. This disease is associated with " polyneuritis, large heart, enlargement of the liver and adrenal glands and hydro-pericardium, with or without generalized oedema." 3. *Infective polyneuritis.* This is merely an infection, the liability to which depends upon vitamin B deficiency. The authors expect to find a similar difference in the etiology of human beriberi-like polyneuritis. One variety of rice investigated, which was known to be productive of human beriberi, gave rise to beriberi columbarum, while 27 other varieties were found to be non beriberi-producing, though most of them caused polyneuritis columbarum. These results are of great interest and importance.

Section IV of the memoir deals entirely with chemical analyses of the various rice samples. The percentage of phosphoric acid in a given rice is a fairly reliable indicator as to its vitamin B content, and to its power of curing or preventing polyneuritis columbarum, yet it is not reliable with regard to the cure or prevention of human beriberi in endemic areas. " A rice which contains over 0·4 per cent. of phosphoric acid may be associated with beriberi columbarum in the laboratory or with human beriberi in endemic areas of this disease, while a rice which contains less than 0·4 per cent. of phosphoric acid often forms the staple article of diet in localities where the disease is unknown."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Beriberi endemic
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The final opinion of the authors regarding the fundamental question in the present research may best be given in their own words, found among the conclusions to section III—" The basal factor in the causation of beriberi in India is a fundamentally poor diet, whether of rice or other food grains, which provides an insufficient supply of vitamin B, but which is not completely lacking in this vitamin."

It is difficult to do justice in a small space to this extremely valuable contribution to the literature of beriberi. The name of the senior author alone is a sufficient incentive to all those interested in the subject to make a first-hand acquaintance with the memoir.

A. Douglas Bigland.

CASTEX (Mariano R.) & GREENWAY (Daniel). **Le entozoosis en su relación con la toxemia intestinal**—*La Prensa Médica Argentina.* 1925. Jan. 30. 112 pp. With 10 figs. on 2 plates. [30 refs.]

This book will not have been published in vain if it is regarded in the light of an outstanding example which it unwittingly affords of the danger of jumping to conclusions. Thus, when we are told that among other symptoms flatulent dyspepsia, headache, vertigo, daily fever, lumbago, pruritus, amenorrhoea, dysmenorrhoea, muco-sanguineous stools, to name but a few, are associated with Blastocystis, Chilomastix, *E. histolytica, E. coli*, we can well believe the fact, but when further we are told that treatment orally with thymol, turpentine, quinine, methylene blue, salol, sulphur, salicylate of bismuth and neosalvarsan, and rectally with enemas of creosote, salicylic acid, benzene, glycerin, nitrate of silver, potassium permanganate, iodoform, dermatol, etc., bring about satisfactory results in some cases [the words are the authors'], that is, disappearance of symptoms and of protozoa, we cannot without further evidence regard the " post hoc " as the " propter." No experimental work with these parasites (or commensals) is recorded as having been undertaken by the authors, nor any microscopical observations of the lesions produced, or even a statement that any such lesions existed.

H. Harold Scott.

DIEUDONNÉ (A.) & WEICHARDT (W.). **Immunität Schutzimpfung und Serumtherapie.** (Elfte, stark umgearbeitete Auflage.)—pp. vii + 250. 1925. Leipzig: J. A. Barth. [Price Rm. 11.70]

Dieudonné and Weichardt's little handbook of Immunology, now in its eleventh edition, is an admirable one of its kind, and must appeal strongly to the German student. The source of that appeal is to be found in the fact that its authors have been well-known and active workers in this field since the palmy days of twenty-five or thirty years ago, which saw the birth of a new science. The first edition of this work appeared in 1895, and in this, the latest edition, the old arrangement of the subject-matter is maintained, but it is clear that the authors have taken pains to note recent developments especially in the domains of protein- and chemo-therapy. To anyone desiring to refresh his memory with a concise and logical account of the development of the subject and of its practical applications in diagnosis, treatment and prophylaxis, this book may be heartily commended. It has its defects nevertheless. It is by no means a complete vademecum; its authors appear to be oblivious of the fact that immunology is widely cultivated outside Germany; yet its very conservatism, apparent for instance in its allegiance to the side-chain theory of EHRLICH, is not unwelcome at a time when theories of immunity which have served their day, are undergoing active revision.

The book closes with two appendices, one dealing with the technique of certain outstanding serological tests, and the other containing a glossary of immunological terms.

J. C. G. Ledingham.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 8.

FURTHER WORK ON THE TREATMENT OF SLEEPING SICKNESS: A CRITICAL REVIEW.

By Warrington Yorke, M.D.
Sectional Editor, Tropical Diseases Bureau.

Since the appearance of the previous review on this subject in November, 1921 (this *Bulletin*, Vol. 18, pp. 155-174), a number of important observations have been made dealing particularly with the therapeutic value of two comparatively new drugs, viz., Tryparsamide, and "Germanin," or, as it is more generally known, "Bayer 205"; and it appears to the reviewer that it might be useful to summarize the results hitherto obtained with these drugs in the treatment of human trypanosomiasis.

Germanin, or "Bayer 205."

This drug, the chemical constitution* of which has not so far been published, is a product of Fried. Bayer & Co., Leverkusen. It contains neither arsenic nor antimony, and is a white flocculent powder, readily soluble in physiological saline and in distilled water: the solution is odourless and has a slightly bitter taste; it is neutral to litmus, keeps well, and stands sterilization. The drug was sent to Haendel and Joetten (1920), and to Mayer and Zeiss (1920), for trial, and proved remarkably successful in the treatment of experimental trypanosomiasis in small animals. These excellent results were speedily confirmed by other workers.

The first case of sleeping sickness treated with Germanin came from Fernando Po, where he was infected with *T. gambiense* in October, 1919. He was admitted to the Hamburg School of Tropical Medicine in March, 1920, and given two doses—each consisting of 0·2 gm. of

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*Fourneau, Tréfouël and Vallée (1924*a* & *b*) believe that they have discovered the formula of "Bayer 205," viz.: The urate of meta-aminobenzoyl-para-methyl-meta-aminobenzoyl-I-amino-naphthalene-trisulphate of sodium-4-6-8. Owing to the difficulty experienced in obtaining a sufficiency of "Bayer 205," the authors state, however, that they are not absolutely certain. They have prepared a substance which they designate "309," and which they believe is identical with "Bayer 205."

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the drug intravenously—at an interval of seven days. This had, however, but little effect, the trypanosomes increased in number, and tartar emetic was administered; but subsequent experience has shown that the doses given in this case were far too small.

The second case in whom this drug was tried was a patient of the reviewer [YORKE (1921)]. He became infected with *T. rhodesiense* in north-eastern Rhodesia in September, 1920, and after various courses of treatment with tartar emetic, antimony oxide and soamin had been given unsuccessfully in Africa, the patient was invalided home and admitted to the Liverpool School of Tropical Medicine in March, 1921. Further injections of tartar emetic and atoxyl were given, but the infection appeared to be almost completely resistant to these drugs, and the patient went steadily down hill, although no definite nervous symptoms had manifested themselves. As the reviewer was unable to obtain any Germanin for trial, the patient was sent to Hamburg in July, 1921, for treatment with Germanin. On July 9, an intravenous injection of 0·5 gm. of the drug was given, and this was followed by an injection of 1 gm. on each of the next two days, and by a further injection of 1 gm. after an interval of a week. In view of the development of albuminuria and of very slight haematuria treatment was now stopped. The patient, whose blood had become negative within a few hours of the first injection, rapidly improved, has not relapsed, and is alive and well at the time of writing (May, 1925).

The striking success of Germanin in this case, in which the ordinary preparations of arsenic and antimony had failed, naturally focussed attention upon it, and KLEINE and FISCHER were sent out to Northern Rhodesia and to the Congo to test the therapeutic value of the drug on a large scale.

KLEINE and FISCHER published a preliminary account of their work in 1922, and their final reports in 1923 and 1924. Thirty-five cases of *T. rhodesiense* infection were treated. Lumbar puncture was rarely made before treatment, but probably the percentage in the nervous stage of the disease was high, as about half of the cases had to be carried into the camp. The routine treatment consisted in giving 1 gm. subcutaneously on the first, tenth and eighteenth days respectively; those with trypanosomes in the cerebrospinal fluid, and those which relapsed with parasites in the blood received two further injections. When the authors left Rhodesia a few months later (November, 1922) one case had died, but the others had all shown remarkable improvement. Three months after commencement of treatment lumbar punctures were made in 21 patients, and in 8 of these trypanosomes were found. The authors state that these cases all presented nervous symptoms at the commencement of treatment and that at the time of lumbar puncture these symptoms had disappeared; so much so, indeed, that 6 of the 8 patients gave an appearance of being decidedly vigorous and performed heavy work. KLEINE and FISCHER believe that "Bayer 205" is able to exercise some influence upon the parasites in the brain, and that the trypanosomes which are not killed off are nevertheless greatly reduced in virulence. About six months later (April, 1923), after the authors had left Rhodesia for the Congo, they heard from the Native Commissioner at Lundazi that three more of their cases had died; two of these were severely affected at the time of treatment and the third apparently died from an abdominal tumour.

In the Congo, KLEINE and FISCHER treated about 150 patients, most of whom were in the first or second stage of the disease, and about 10 per cent. in the third stage. Lumbar puncture was done before treatment in 24 cases, who showed no nervous symptoms, and were uniformly negative. The routine treatment given was 1 gm. of the drug intravenously on the first, third and fifteenth days. In all the cases of the first and second stages improvement was obvious, and of 96 patients whose blood was examined at least every week for five months after the third injection, two only—both children—relapsed. In seven cases in the third stage of the disease, five injections of " Bayer 205 " produced no improvement; the blood of all, however, remained free from trypanosomes as long as they were under observation, but trypanosomes were found in the cerebrospina fluid of two.

Fortunately, a certain amount of information regarding the later history of these two series of cases treated by KLEINE and FISCHER is now available. In a letter to the reviewer, dated Livingstone, September 15, 1924, Dr. Aylmer MAY, Principal Medical Officer o Northern Rhodesia, states that KINGHORN has traced all KLEINE and FISCHER's Rhodesian cases, and that of the 35 treated by them 29 are dead, mostly of sleeping sickness. This is confirmed in a letter from KINGHORN himself, written from Lundazi, and dated October 9, 1924, in which he states that only five of KLEINE's cases are alive, and that the others, so far as he has been able to ascertain, died of sleeping sickness; KINGHORN adds that the five who are still alive are healthy and that he could not find any trypanosomes in the peripheral blood.

Information is also available regarding the later history of the Congo cases. FONTANA, in a paper published in April, 1924, and presumably compiled from data obtained a month or two earlier—that is, about a year after the cases were treated by KLEINE and FISCHER—supplies information regarding 83 of the 150 cases. Sixty-five were at the time of treatment in the first stage of the disease, and 18 in the second stage. Of the 65 cases belonging to the first group 51 are probably cured, 8 have relapsed and 6 are dead; and of the 18 cases in the second group 2 are probably cured, 8 have relapsed, and 8 are dead. FONTANA also supplies the interesting information that the average relapse period was 226 days and the minimum 145 days.

TANON and JAMOT (1924) record the result of treating 39 cases of sleeping sickness (*T. gambiense*) infected in a village of Abong-M'Bang in the Cameroons. They divided the cases into the following four categories:—

1. Those exhibiting clinical signs of the first stage of the disease with parasites in the blood, but with normal cerebrospinal fluid. *First stage* (13 patients).
2. Those having a slight degree of meningeal infection manifested by a slight lymphocytosis and by a slight excess of albumose in the cerebrospinal fluid. *Early second stage* (12 patients).
3. Those with a marked excess of lymphocytes and albumose and some trypanosomes in the cerebrospinal fluid. *Advanced second stage* (6 patients).
4. Those exhibiting emaciation, cachexia, somnolence and nervous signs. *Third stage* (6 patients).

The patients were of all ages between 6 and 40, and were of both sexes. The amount of the drug given to each patient was about 3 gm., and it was administered in one of two ways, either in three doses of ·5 gm., 1 gm., and 1·5 gm. respectively, at intervals of two days, or in two large doses of 1·5 gm. each at an eight-day interval. The children were given smaller quantities, those of from 6 to 10 years getting ·2 gm. and ·4 gm., and those of 10 to 13 years ·5 gm., ·7 gm. and 1 gm. In 37 cases the earlier injections were given subcutaneously and the later intravenously. No relapse was observed in 30 of the 37 within an observation period of nine months, but in seven relapses occurred. These were for the most part transitory: one case relapsed on the 24th day, but on the 26th parasites disappeared permanently; one case relapsed on the 17th day, and parasites persisted for four months and then disappeared; two other cases relapsed on the 17th day and trypanosomes persisted for five months and then disappeared; one case relapsed after five months and another after six months, parasites persisting for a month and then disappearing; and in the last case a relapse occurred after one and a half months, parasites persisted for 15 days and then disappeared, to reappear again after two months. The author writes that the parasites are not then all definitely destroyed at the commencement, but may reappear at intervals again to disappear; only exceptionally do they reappear to persist. It occurs to the reviewer that this phenomenon may not be due to any particular virtues of " Bayer 205," but may be explicable on the fact that in the locality the infection was of low virulence, either because of some inherent feebleness in the parasite or because of some exalted resistance on the part of the native, and that the same transitory relapses might equally well be observed after the administration of a few doses of atoxyl or salvarsan.

TANON and JAMOT, although they give no details regarding the state of the cerebrospinal fluid before and after treatment in the individual cases, make the general and important statement that its condition is in no way modified by the drug and that apparently " Bayer 205 "cannot act on the trypanosomes in the subarachnoid space.

The remaining two of the 39 patients were treated intrathecally. The first, a woman 20 years old, in the third stage, was given ·5 gm., and death resulted seven hours later; the second, a man 25 years old and in excellent condition, was given ·25 gm., but here again death resulted in four hours.

Undoubtedly one of the most important papers on the action of Germanin which has so far appeared is that of VAN DEN BRANDEN and VAN HOOF (1924). These authors have tested the drug on 79 patients at Leopoldville, Belgian Congo, but, unfortunately, some have escaped observation. They divide the patients into two categories: (1) Those in the *first stage* of the disease with fever, enlarged glands and with not more than 15 elements per cmm. in the cerebrospinal fluid; and (2) those in the *second stage* exhibiting a meningeal reaction indicative of profound changes in the central nervous system.

The oral method of administration was tried in one case, 15·5 gm. being given, in fractional doses of 1 gm., 1·5 gm., 2 gm., 3 gm. and 5 gm., within a period of a month; the patient was in the first stage of the disease. Trypanosomes persisted in the circulation and consequently this mode of administration was abandoned as useless.

In order to ascertain the duration of blood sterilization obtained by a single dose, two patients, one in the first stage and one in the second stage with 1,440 lymphocytes per cmm. in the cerebrospinal fluid, were given an intravenous injection. The first patient, who was given 1 gm. of the drug on October 10, 1922, has remained well with negative blood and normal spinal fluid presumably up to the time the report was written, viz., February 15, 1924; the second patient, who received 2 gm. of the drug, died five months later from sleeping sickness, but the blood never again showed parasites.

After having made these preliminary observations, VAN DEN BRANDEN and VAN HOOF proceeded to make a systematic trial of the drug in a series of cases in the first and second stage. Nineteen cases in the first stage were given the ordinary course of treatment, viz., 3·5 gm. in four doses, the first of ·5 gm., followed the next day by a dose of 1 gm., and then at intervals of six to eight days by two others each of 1 gm. Of the 19 cases so treated 12 have not relapsed during a period of 5-16 months (in nine the period was more than a year); of the remaining seven cases, one died from intercurrent disease, a second disappeared, and the other five have shown trypanosomes in their blood from time to time, although their general condition has remained excellent. The authors state that it will be interesting to ascertain whether any of these patients recover without additional treatment. Details of all these cases are set forth in a table showing, amongst other things, the condition of the cerebrospinal fluid before and after treatment. The authors state that the further progress of the cases will be carefully watched, and surmise that in three of them there is little chance of a permanent cure, as the slight alteration in the spinal fluid suggests that the infection continues, and that without further treatment they will die.

Twenty-five cases in the second stage of the disease were treated by VAN DEN BRANDEN and VAN HOOF; in 13 the drug was given intravenously, in three it was given both intravenously and intrathecally, and in nine the drug was injected intravenously and the serum afterwards withdrawn and injected intrathecally on the lines suggested by REICHENOW and later by MARSHALL. Of the 13 patients treated by intravenous injection alone, some received only the ordinary course of 3·4 gm., but others were given as much as 17·5 gm.; six are dead, one has relapsed with trypanosomes in the blood and the remaining six are still negative, but are in bad condition, and the lymphocytosis in the cerebrospinal fluid has increased. No particular advantage seemed to result from the larger doses.

As the result of testing the combined intravenous and intrathecal administration in these advanced cases, the authors conclude that intrathecal administration is useless and dangerous; even so small a dose as ·05 gm. may produce grave symptoms and ·3 gm. may be fatal.

Nine patients were treated by intravenous injections of 1 to 1·5 gm. of the drug combined with intrathecal injections of 5 to 11 cc. of their own serum withdrawn two hours later. The serum proved non-irritating and produced no untoward symptoms. Only one of the nine, who between September 5, 1922, and March 13, 1923, had 16 gm. of "Bayer 205," and 10 cc. of serum intrathecally, appeared to be benefited by the treatment; his general condition improved and the blood remained negative, and there was a diminution in the cell count in the spinal fluid; four of the remainder are dead, and in the others the disease has advanced. VAN DEN BRANDEN and VAN HOOF conclude from these observations that "Bayer 205" is of little use when given to patients in the second stage of the disease.

TABLE I, SHOWING RESULT OF TREATMENT OF EUROPEAN CASES OF SLEEPING SICKNESS WITH "BAYER 205."

No.	Author.	Initials (of case).	Where and when infected.	Previous treatment.	"Bayer 205."		Result.	Post-treatment observation period.	Remarks.
					Dates of administration	Total dosage.			
1.	Mühlens & Menk.	?	Fernando Po, Oct. 1919.	?	Mar. 1920 ...	·4 gm.	Unaffected ...	—	Given tartar emetic and disappeared.
2.	Mühlens & Menk; and Yorke	G.J.	N. Rhodesia, Sept. 1920.	Much arsenic and antimony.	9-18 July 1921	3·5 gm.	No relapse; alive and well May, 1925.	3 yrs. 10 mths.	—
3.	Mayer & Menk.	J.D.	Congo, Dec. 1920.	Much arsenic and antimony.	30 Mar. 8 Apr. 1922.	4 gm.	No relapse; returned to Congo June 29, 1922. Well Dec. 1923.‡	1 yr. 9 mths.	—
4.	Menk ...	K.F.	Portuguese Africa, Aug. 1922.	A little atoxyl.	26 Sept.-25 Oct. 1922.	5·5 gm.	—	—	Trypanosomes disappeared, no after history available.
5.	Stephens & Yorke.	H.L.S.	Nigeria, Jan. 1922.	A little atoxyl and novarsenobillon.	30 May-27 June, 1922	4 gm.	No relapse; alive and well May, 1925.	3 yrs.	—
6.	Low and Bahr.	McA.	Nigeria, July, 1921.	Antimony and atoxyl.	7 July-11 Sept. 1922.	10 gm.	No relapse; well Feb. 1, 1924.	1 yr. 5 mths.	—
7.	,,	S.B.J.	Congo, Dec. 1919.	Large quantities of antimony and arsenic.	1 Dec.-3 Dec. 1921. 1 Mar.-18 Sept. 1922	3 gm. 8 gm.	No relapse, but a second course. No relapse; well May, 1925.*	2 yrs. 8 mths.	— —
8.	,,	G.S.W.	Fernando Po, Apr. 1919.	Antimony	15 Dec. 1921-19 Apr. 1922	18 gm.	Died 21 Apr. 1922.	—	—
9.	,,	K.	Congo, June, 1921.	Atoxyl ...	27 Dec. 1921-2 Mar. 1922.	10 gm.	Well till 23 Oct. 1923.	1 yr. 7 mths.	Murdered on 23 Oct. 1923.
10.	,,	B.	Nigeria, 1921.	Nil ...	11 Mar.-28 Apr. 1922.	10 gm.	Alive and well Aug. 1923.	1 yr. 4 mths.	—

11.	,,	C.	Nigeria, Oct. 1921.	Antimony and atoxyl.	28 Apr.-26 June 1922.	10 gm.	Alive and well 1924.†	1½ yrs.	—
12.	,,	L.S.	Nigeria, 1922.	Nil ...	23 May-25 July, 1922.	10 gm.	Alive and well July, 1923.	1 yr.	—
13.	,,	Mrs. S.F.W.	Congo, Oct. 1919.	Atoxyl ...	Aug.-Sept. 1922.	10 gm.	Relapsed Jan. 1923.	—	Apr. & May, 1924, treated with tryparsamide; remained well until seen, 5 July 1924.
14.	,,	J.M.	N. Rhodesia, Dec. 1921.	Nil ...	Jan. 1922. 16 June-13 Sept. 4–28 Nov.	2 gm. 14 gm. 15 gm.	Died 7 Jan. 1923.	—	—
15.	Low ...	McD.	Gold Coast, Dec. 1922.	Nil ...	7 Apr.-30 June 1923.	12 gm.	Alive and well 31 Mar. 1924.†	8 mths.	—
16.	,,	McC.	Nigeria, Jan. 1923.	Nil ...	27 June-6 Sept. 1923.	10 gm.	Alive and well Mar. 1925.‡	1 yr. 7 mths.	—
17.	,,	J.	Nigeria, Oct. 1922.	Nil ...	7 Aug.-13 Oct. 1923.	—	Alive and well 14 Feb. 1924.	4 mths.	—
18.	,,	V.	Congo, June, 1921.	Nil ...	14-27 July, 1923. 24 Oct.-28 Dec. 1923.	2 gm. 10 gm.	Alive and well 26 Jan. 1924.	1 mth.	—
19.	,,	A.H.W.†	Nigeria, Sept. 1923.	Tryparsamide 28 July-18 Aug. 1924. 8·5 gm. 25 Aug.-24 Oct. 1924. 30 gm.	21 Nov. 1924-23 Jan. 1925.	10 gm.	Relapsed 25 Aug. 1924. Relapsed 18 Nov. 1924. Alive and well 14 May, 1924.	3½ mths.	Relapsed after 38·5 gm. of tryparsamide and treated with "Bayer 205."
20.	Manson-Bahr.	C.W.R.W.*	Gambia, 1924.	—	June-July, 1924.	5 gm.	Relapsed 8 Aug. 1924. Alive and well, May, 1924.	8 mths.	Relapsed after 5 gm. of "Bayer 205," and treated with Tryparsamide, 9 Aug.-21 Sept., 1924, 24 gm.

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* Information kindly supplied by Dr. Manson-Bahr, 15 May, 1925.

† Information kindly supplied by Dr. Low, 15 May, 1925.

‡ Information kindly supplied by Dr. Mühlens, 25 May, 1925.

Finally, eight ambulatory cases were treated with three to five weekly injections of 1 gm.; two quickly relapsed with parasites in the blood, but in the remainder the blood has been negative for periods varying from four to nine months.

LETONTURIER, DE MARQUEISSAC and JAMOT (1924) tested " Bayer 205 " on 35 cases infected in the Cameroons. The amount of the drug given was a total 3 gm. for an adult in two or three injections at three to seven day intervals. Of the 13 patients in whom the cerebrospinal fluid was normal nine appear to be cured and four have relapsed and have been treated with other drugs; all are in excellent condition. Of the 22 patients in whom the cerebrospinal fluid was more or less altered 11 are dead and of the remainder six have relapsed, nine are in good condition, and two in bad condition. The authors, without giving any details, remark that the drug produced no appreciable modification in the meningeal reactions.

Very important information concerning the effect of " Bayer 205 " is furnished by CHESTERMAN (1924), who treated 17 cases, all well advanced in the second stage of the disease. The cases are divided into two groups, the first comprising nine cases who had received previous treatment with arsenicals, etc., and the second consisting of eight cases who had had no previous treatment. The drug was given intravenously in 1 gm. doses repeated at weekly intervals; the number of doses varied from two to five or six in the different cases. Of the 17 cases, two died of intercurrent bilharzial dysentery, two died of acute nephritis; two who had during previous treatment with soamin suffered from amblyopia, became completely blind; eight returned in periods varying from six weeks to 15 months in a condition worse than when treatment was suspended; one case, who remained with a cell count of 75 in the spinal fluid and was evidently far from normal, was treated with tryparsamide; and 2 cases were evidently improved, but have not been re-examined, although reports received four and five months after treatment indicate that both are well. CHESTERMAN summarizes in a table his pathological findings in the cerebrospinal fluid in 11 of the cases, and, as he states, the results are frankly disappointing, as all exhibited a considerable lymphocytosis and excess of albumen four months or more after treatment.

HANINGTON (1924) gives general information regarding the treatment of a number of cases of sleeping sickness at Sherifuri, Northern Nigeria. He states that the disease is not of the mild form usually associated with West African sleeping sickness, but runs a rapidly fatal course. The patients were practically all of early middle age. When possible the drug was given in 1 gm. doses on the 1st, 3rd, 5th, 12th and 19th days. Up to the end of July, 1924, 11 deaths had been recorded among the 114 cases treated with " Bayer 205," but of the six fatal cases three had received only a single dose of the drug and three only two doses.

In a report dated 7 March, 1925, LLOYD gives further information regarding HANINGTON'S cases. Of the 131 treated with " Bayer 205," 15 are dead. Of these, 11 had not had the full course, one had received 5, one 6, and two 7 injections; the last three were advanced cases of the disease when treated. Three were found to be infected a year after their initial treatment, but LLOYD considers these were re-infections and not relapses. [The evidence supporting this hypothesis is, however, not very convincing.] LLOYD writes that the best evidence of the efficacy of the drug in the early stages of the disease is afforded by the history of the five natives who acquired the disease whilst on the staff of the Tsetse Investigation Commission. Of these, two are in perfect health 12 and 22 months respectively after treatment. Only one of the 31 cases appeared to have been really resistant to the drug. He was in a very advanced stage when treated, and after receiving three doses of the drug died a few days later with trypanosomes in the blood. The epidemic in the Sherifuri district appears to have died down. In 1923, 99 cases reported, in 1924, 47 cases, and in the first two months of 1925 only 3. LLOYD considers that it is highly probable that the use of "Bayer 205" has largely helped to stem the epidemic.

From Table I, which summarizes the results obtained in the treatment with "Bayer 205" of Europeans suffering from trypanosomiasis, it will be seen that Case 18 was unaffected, the dose of the drug given being now known to be quite inadequate, and that no after history is available in Case 4. Of the remaining 18 patients, two Case 8, infected with *T. gambiense*, and Case 14, infected with *T. rhodesiense*—are dead; two -Cases 13 and 20 -have relapsed; the other 14 cases have done well, but in six of these the observation period is less than one year, whereas in eight it varies from one year to practically four years. It should be noticed that the two patients (Cases 13 and 20) who relapsed after "Bayer 205," were both subsequently treated with tryparsamide and both have done well and have not relapsed within an observation period of two and eight months respectively; on the other hand, Case 19, who relapsed after a course of 38·5 gm. of tryparsamide, was subsequently treated with "Bayer 205," and has not relapsed after three and a half months.

These results, so far as they go, are very satisfactory, but it must be remembered that although spinal punctures were not made, probably most of the cases were in the first stage of the disease at the time of treatment.

Tryparsamide.

Information regarding the mode of preparation and chemical constitution of this preparation was first published in 1919 by JACOBS and HEIDELBERG, of the Rockefeller Institute. Tryparsamide is the sodium salt of N. phenylglycineamide-p-arsenic acid, and it is stated to be easily prepared, stable and soluble. At the same time, PEARCE and BROWN gave an account of its biological behaviour and therapeutic action on animals experimentally infected with trypanosomiasis. Two years later (1921) PEARCE and BROWN published the results of further experiments regarding the therapeutic value of tryparsamide on mice, rats and rabbits experimentally infected with *T. rhodesiense* and *T. gambiense,* from which the conclusion is reached that its action on the former parasite is much less than on the latter.

With a view to testing the action of the drug on infected human beings, Miss PEARCE was sent by the Rockefeller Institute to the Belgian Congo in May, 1920, and conducted a long series of most careful observations at the Government laboratory and Hôpital de la Reine in Léopoldville: her report, which is based on observations made on 77 cases, was published in December, 1921.

The 77 cases represented all grades of infection and included previously untreated patients, as well as several who had been already treated with one or more drugs. Trypanosomes were found in all cases except eight, which were under treatment at the time they were examined; a lumbar puncture was done in 72 cases. Investigations were first made with a view to ascertaining how soon after a single dose of tryparsamide the gland juice became negative, and it was found that in 33 patients gland punctures were always negative within 24 hours of a dose varying from ·3 to 7 gm. or 4·7 to 112 mgm. per kilo. of body weight: similarly, in 35 cases it was found by the triple centrifugation method that the blood was negative within 21 hours after the administration of 1 to 5 gm. of the drug. The general conclusion reached from this part of the work is that 1 to 5 gm. of tryparsamide brings about peripheral sterilization as indicated by gland puncture and blood examination in an average of 6 to 12 hours, and it appears that this result is obtained whether the drug is given intravenously or intramuscularly.

The next question considered was the duration of peripheral sterilization obtained by a single dose of the drug: 21 patients, either in the first stage of the disease, or early in the second stage, as indicated by a slight excess of cells in the spinal fluid, were given ·5 to 5 gm. of the drug; of these 12 relapsed within 17 to 58 days, and 9 did not relapse within an observation period of 40 to 111 days. The drug was given intravenously except in four cases, and Miss PEARCE points out that in these last cases the duration of action was definitely prolonged. In 14 of the cases with initial normal or slightly abnormal spinal fluids a lumbar puncture was made about five weeks after the administration of the drug, and in every instance but one, in which the result was uncertain because of blood contamination, the second cell count continued to be normal, or was decreased towards the normal. The general physical reaction of the patients was prompt and satisfactory; the subjective symptoms disappeared and the pulse rate and temperature became normal within a few days.

Miss PEARCE next deals with the effect of the administration of repeated doses of tryparsamide in early and in advanced cases. The first group of early cases consisted of the 12 who relapsed after the preliminary single dose and two others who had also had a preliminary dose. Ten of these patients were treated at weekly intervals with four to nine injections varying from 20 to 111 mgm. per kilo., and four were placed on a fortnightly schedule; the drug was given intravenously in all cases. The second group of early cases consisted of 13 who had previously been untreated: these were given 1 to 5 gm. tryparsamide at weekly and fortnightly intervals. Trypanosomes were found in the lymph juice before treatment in all cases and the spinal fluid showed a normal count in cells in six cases, a slight increase in five cases, and was not examined in two cases. In both groups the preliminary results were excellent; the blood and gland juice became and remained negative, there was general clinical improvement, and the spinal fluid remained normal, or in those cases in which it was slightly changed before treatment tended to become normal.

Finally, 35 patients whose spinal fluid showed that the disease had involved the cerebrospinal system were treated with repeated doses of tryparsamide intravenously. Two of these patients deserted after the first dose, two were practically moribund on admittance and three others were under observation for such a short time that they are not included in the records. The author divides the remainder into two groups; 18 who had not been previously treated and 10 who had been treated before. The spinal fluid examined before the administration of tryparsamide showed from 15 to 572 lymphocytes per cmm., together with large mononuclear and mulberry cells. Most of the patients exhibited pronounced signs of nervous and mental symptoms and were anaemic and debilitated. In most instances the patients were under observation for a sufficient time to permit of subsequent lumbar punctures as well as other clinical examination. As in the previous cases, there was immediate peripheral sterilization, and repeated examination of lymph juice and blood films made during the period of observation was negative in all cases. In general, the physical status of the patients was materially benefited. The early termination of the treatment in three cases was followed by a clinical exacerbation and death. The nervous and mental symptoms which were present in many instances were greatly improved or completely eliminated, except in two very advanced cases. The effect of the drug is further illustrated by the marked and rapid diminution of the cells in the spinal fluid. In general, three or four weekly doses of 3 to 5 gm. produced decreases of from 57 to 98 per cent. in an average of five weeks. Of five patients, whose treatment was limited to one such course, the cell count continued to decrease in four instances, as shown by a practically normal third examination made 9 to 12 weeks after admittance, while in one patient there was no further decrease. Sixteen patients who were given a second course of treatment showed a continued decrease of cells; three showed practically no change from the count made after the first course of treatment; in one there was a slight increase in cells; and in another, after three irregularly spaced doses, the cells had returned to practically the original count. Miss PEARCE notes that the use of semi-weekly smaller doses of 2 gm. had apparently no advantage over weekly doses of 3 or 4 gm.

The only untoward symptoms noticed was dimness of vision in nine advanced cases, five of whom had received previous arsenical treatment. There was no instance of visual disturbance of any kind in the early cases or in the first stages of the cerebrospinal period of the disease or after any single dose of tryparsamide; the largest dose given was 7 gm. In the majority of cases the visual disturbance was purely transitory. Miss PEARCE concludes that the occasional occurrence of visual disturbance does not constitute an objection to the use of the drug, and that doses of 3 gm. or over should not be given oftener than once a week.

VAN DEN BRANDEN and VAN HOOF, in a paper published in October, 1923, give later information regarding the fate of Miss PEARCE'S cases. Twenty of the 21 early cases, to whom Miss PEARCE gave a single injection of the drug, were followed. Apparently, at least three more of the 21 cases relapsed after Miss PEARCE left the Congo, and the authors state that the relapse period among these cases varied from 17 days to 13 months. All those who relapsed were re-treated. The total quantity of the drug administered to each of the 20 cases varied from 2 to 54 gm.; all are apparently cured, the post-treatment observation period being from six months to two years and seven months in the different cases.

VAN DEN BRANDEN and VAN HOOF then give a summary of the after history of each of the 35 advanced cases treated by Miss PEARCE. Most of these patients have now been under observation for over a year after treatment, but some of them for not more than six months. As Miss PEARCE herself records, three are dead, 16 exhibit—six months to more than a year after the end of treatment—a normal spinal fluid and appear to be cured; in three the spinal lymphocytosis has increased, in two it has remained stationary, and in the remaining 11 it has diminished appreciably, but has not become normal. The authors conclude by remarking that tryparsamide, which can be administered indifferently either into the muscle or into the veins, seems to be the most active arsenical preparation known for the treatment of sleeping sickness; they add, however, that it causes visual disturbances in certain cases and may actually produce blindness.

LEFROU and OUZILLEAU (1922) record a few observations made with the object of ascertaining the possibility of using tryparsamide as a prophylactic cure in the bush. With this object in view, they treated five cases in Brazzaville. The spinal fluid was either normal or contained a slight excess of lymphocytes at the time of treatment; the first patient was given 1 gm. intravenously and relapsed 25 days later; the second was given 1 gm. subcutaneously and relapsed 84 days later; the third was given 3 gm. intravenously, and had not relapsed in 126 days; the fourth was given 2 gm. subcutaneously and had not relapsed a year later, and the fifth was given 2 gm. intravenously and relapsed 114 days later. The authors state that 2 gm. appears to be the maximum dose that can be given subcutaneously, and it produces a considerable local reaction; 5 gm. produced a severe abscess. It is concluded that for the purpose in view the drug is no more useful than atoxyl.

A very valuable series of observations on the therapeutic action of tryparsamide was published by CHESTERMAN in 1923 and 1924. The work, which was done at Yakusu, near Stanleyville, Belgian Congo, between the months of August, 1921, and September, 1922, was undertaken to test the results of repeated administration of large doses at weekly intervals by the intravenous route with the object of rendering normal the cell count of the spinal fluid of the most advanced cases. The 40 cases reported upon were chosen from among the over 300 cases diagnosed during the period because: (1) The source of their injection was known; (2) they showed definite symptoms of nervous involvement and altered spinal fluid; and (3) they consented to remain in the lazaret, where there was no possibility of reinfection. The cases comprised men, women and children. Many had to be carried to hospital in the first instance, and others had for some time given up their work on account of the disease.

In 31 cases the diagnosis was confirmed by finding trypanosomes in the gland juice, blood and spinal fluid and in nine by the discovery of a pathological increase in the cell count of the spinal fluid. A course of eight weekly injections of 3 gm. of tryparsamide was regarded as the normal, but in some cases this had to be modified on account of the development of visual disturbance. The cerebrospinal fluid was examined, except in very few instances, before treatment, and also at various intervals after treatment. The patients are considered in three groups: (A) Containing 24 cases who had received no previous treatment; (B) containing 10 cases who had previously received varying amounts of atoxyl, tartar emetic, etc.; and (C) containing six cases previously treated by the intrathecal serum method. All the data concerning the individual cases comprising the three groups are admirably set forth in tables, and in his second paper, published in 1924, CHESTERMAN gives the later history of the cases in such a manner as to be followed easily by the reader.

In the Group A cases the examination of the spinal fluid, made before treatment in all but three of the 24 cases, showed a great increase in the cell count in all instances (110 to 2,000 per cmm.) and, in addition, trypanosomes were found in seven cases. In five of the cases an obviously excellent clinical condition was confirmed by the discovery of a normal cerebrospinal fluid 22 to 29 months after treatment; one case seen by the author on itineration was in excellent health; one case also in good condition had a negative blood after 20 months, but his spinal fluid still contained 12 cells per cmm., and it is possible he may relapse; two cases are reported by a white colleague to be alive and well, and 14 cases are classed as *uncured.* Of these *uncured* cases five are referred to as *non-cures* in so far as after the first course of tryparsamide the spinal fluid was still not normal; three of these, however, received only 1 gm. and 2 gm. weekly doses, which are probably too small. The remaining nine uncured cases are those who relapsed. A single course of treatment, which in many of the 24 cases was undoubtedly inadequate, has thus resulted, after approximately two years' average observation, in nine (37·5 per cent.) apparent cures, five (21 per cent.) non-cures (two dead), nine (37·5 per cent.) relapsed, three (12 per cent.) dead, and one (4 per cent.) untraced.

The 10 cases comprising Group B had, at the time of treatment with tryparsamide, ceased to receive any benefit from the previous injections of atoxyl, tartar emetic, etc. The immediate clinical improvement was hardly less striking than in the previous group, but the later report shows—as was indeed predicted in the earlier report—that seven of the 10 relapsed, and four have died. CHESTERMAN says that this is not surprising in view of the production in most cases, by the previous treatment, of arsenic resistant strains of trypanosomes; moreover, in most of the seven, it was impossible to give an adequate course of tryparsamide. In the remaining three cases the result is very encouraging; one case who had previously had 10·6 gm. of atoxyl without much benefit, and with slight visual impairment, and who showed 250 cells per cmm. of spinal fluid before the 8 gm. course of tryparsamide was given, was apparently perfectly well with a normal spinal fluid 30 months later; the second and third cases in all respects were very similar to the above, and likewise in perfect health with a normal spinal fluid 28 and 22 months after courses of 24 gm. and 20 gm. of tryparsamide respectively.

Of the six cases comprising Group C two died shortly after the intrathecal serum treatment before tryparsamide could be given. Three of the four surviving cases are in excellent health two years after treatment, and the spinal fluid in two of them has returned to normal, and in the others almost to normal; the fourth case has relapsed, as is shown by the presence of 160 cells per cmm. in the spinal fluid.

The general result of these careful observations shows that 15 (40·5 per cent.) of 37 patients (one of the original 40 having disappeared and two having died before treatment) have remained well without relapse for an average period of two years after a single course of tryparsamide. Without exception all exhibited marked signs of involvement of the central nervous system confirmed by an average cell content of the cerebrospinal fluid before treatment of 630 cells per cmm. and the detection of trypanosomes there in seven cases. Two or three were unable to walk, one was incontinent, and all had long passed the stage when any hope of a cure could be entertained from atoxyl or other drugs. CHESTERMAN believes that the failures are, in many instances, due to faulty or insufficient dosage; he is convinced that the curative power of tryparsamide in nervous infections is superior to that of " Bayer 205."

LETONTURIER, DE MARQUEISSAC and JAMOT (1924) have tested the action of tryparsamide on 14 cases of sleeping sickness in the Cameroons. One of the cases was in the first stage of the disease, three at the commencement of the second stage, six definitely in the second stage, three in the third stage, and one case was demented. The drug was given subcutaneously in a dose of ·04 gm. per kilo. every six or seven days until from 10 to 21·5 gm. had been administered; owing to the limited quantity of the drug available only a single course of treatment was given to each case. A detailed history is given in each instance. The first case, in whom the cerebrospinal fluid was normal, received between February 5 and March 13, 1924, 13 gm. of tryparsamide; the immediate result was excellent, but he relapsed on March 19, 1924. Of the three cases in the early second stage in whom the cerebrospinal fluid contained from six to 32 cells per cmm., and who received 15·5 to 19 gm. of the drug, all were greatly benefited, and subsequent examination of the spinal fluid made a few weeks after treatment showed a normal or diminished cell count. The six cases definitely in the second stage received from 14·5 to 21·5 gm. of tryparsamide, and all were greatly benefited, the cells in the spinal fluid, which before treatment varied from 53 in one case to 334-848 in the other five, fell within a few weeks of cessation of treatment to from 12·4 to 48 per cmm. In the last four cases, who were all very advanced, no spinal puncture was made, but all improved greatly. Only two of this series of cases had relapsed at the time of writing, but as this was but a month or two after cessation of treatment, nothing can be said on the point.

Conclusions.

In light of the information which is summarized above, it appears to the reviewer that it is now possible to draw certain definite conclusions regarding the relative values of the two drugs and to indicate broadly what is to be expected of them :—

(1) All observers are agreed that both drugs produce immediate peripheral sterilization in infections due to *T. gambiense*, not only in early cases, but also in advanced cases with pronounced nervous symptoms. KLEINE & FISCHER's Rhodesian cases and the European Cases 2 and 14 (Table I) indicate that " Bayer 205 " likewise produces immediate peripheral sterilization in patients in all stages of *T. rhodesiense* infection. Unfortunately, no information is as yet available regarding the action of tryparsamide on the latter infection.

(2) The peripheral sterilization is accompanied by definite physical improvement. This is produced by both drugs in practically all early cases of *T. gambiense* infections, and even in many advanced cases with marked nervous symptoms; and the evidence of KLEINE and FISCHER shows that a similar result is produced by " Bayer 205 " in patients suffering from all stages of *T. rhodesiense* infection.

(3) A single short course of two or three injections of either drug may produce, in early *T. gambiense* infections, a peripheral sterilization so prolonged as to suggest permanent cure. The European Case 2 (Table I) and the fact that five of KLEINE and FISCHER's 35 Rhodesian

cases are alive and well and apparently free from infection about two years after treatment indicate that a few grammes of " Bayer 205 " may similarly produce permanent cures in a proportion of *T. rhodesiense* infections.

(4) There is practically unanimity of opinion that " Bayer 205 " in no way influences the meningeal reaction. MENK (1923) examined the cerebrospinal fluid of a case of trypanosomiasis 36 hours after the last of three intravenous injections—the first of 0·5 gm. and the other two of 1 gm.—of " Bayer 205 " given on successive days, but failed by the biological test to detect any evidence of the presence of the drug. The excellent papers of VAN DEN BRANDEN and VAN HOOF, and of CHESTERMAN, show clearly that in *T. gambiense* infections of the second stage " Bayer 205 " does not diminish the lymphocytosis or albumose content in the cerebrospinal fluid, but that on the contrary these changes continue in spite of the drug and the disease proceeds to a fatal termination. The record of KLEINE and FISCHER that three months after commencement of treatment lumbar puncture revealed the presence of trypanosomes in the cerebrospinal fluid of eight of 21 Rhodesian patients indicates that the same is true of *T. rhodesiense* infections, and this is further confirmed by KINGHORN'S observations that in less than two years 30 of KLEINE and FISCHER'S 35 patients, who were for the most part advanced cases at the time of treatment, had died.

The observations recorded by TANON and JAMOT (1924) and by VAN DEN BRANDEN and VAN HOOF (1924) show that intrathecal administration of " Bayer 205 " to patients in the second stage of the disease is not only useless, but highly dangerous, and that death may speedily follow such small doses as ·25 to ·3 gm. The latter authors have also shown that although intrathecal administration of the patient's serum withdrawn shortly after the intravenous injection of " Bayer 205" is harmless, it is of no therapeutic value.

(5) There is, however, equally convincing evidence that tryparsamide exerts a profound influence on the meningeal reaction in *T. gambiense* infections. Firstly, there is the series of 35 advanced cases treated by Miss PEARCE with repeated doses of tryparsamide. Examination of the spinal fluid of these cases before treatment showed 15 to 572 lymphocytes per cmm. together with large mononuclear and mulberry cells. The later history of the cases is given by VAN DEN BRANDEN and VAN HOOF, who, writing at a time when most of them had been under observation for more than a year after treatment, record that three are dead, in three the spinal lymphocytosis has increased, in two it has remained stationary, in 11 it has diminished appreciably, but has not become normal, and in 16 it has become normal. Secondly, there is the equally striking series of cases recorded by CHESTERMAN (1923-24), which shows that of 37 advanced cases, all of whom had pathological cerebrospinal fluids (as indicated by an average cell count of 630 lymphocytes per cmm.) before treatment, 15 have remained well without relapse for an average period of two years after a single course of tryparsamide. Finally, corroborative evidence of a like nature is found in the paper of LETONTURIER, DE MARQUEISSAC and JAMOT (1924).

(6) Both drugs must be used with caution or serious results may ensue. " Bayer 205 " unfortunately produces nephritis, which may be fatal, as in the case recorded by STONES, where acute nephritis, accompanied by suppression of urine, followed the administration

of only 3·5 gm. of the drug in four doses over a period of six weeks, and in the two cases recorded by CHESTERMAN who died of acute nephritis after having received, respectively, only five and 10 weekly doses each of 1 gm. On the other hand, many cases tolerate quite well, with only slight albuminuria, 10 or 12 weekly doses of 1 gm. each. Apparently the main, or for practical purposes the only, danger of tryparsamide is that it may cause visual disturbances, and in certain cases complete blindness.

(7) The general conclusion appears to be that, apart from its peripheral sterilizing action and the immediate physical improvement which it produced, "Bayer 205" is useless in advanced cases of either *T. gambiense* or *T. rhodesiense* infections, in so far as it has no effect on the cerebrospinal infections and the disease proceeds to a fatal issue. For this class of case tryparsamide should undoubtedly be employed: unfortunately, no information is as yet available regarding its action on *T. rhodesiense* infection, but in advanced *T. gambiense* cases its effect is remarkable in that it has been definitely shown to exert a beneficial action on the pathological cerebrospinal system which is without parallel in the therapy of this disease.

In the treatment of early *T. gambiense* infections both drugs appear to be very valuable, and it is as yet too early to draw any inferences which might guide us in deciding which should be used in any particular case. Possibly the previous history of the case may afford some indication; if the patient has already received a considerable quantity of arsenic "Bayer 205" may prove more useful and less dangerous than tryparsamide, but evidence on this and other similar considerations is still to be obtained. Moreover, one must bear in mind that the renal changes produced by "Bayer 205" may be a counter-indication to its indiscriminate use in combination with, or immediately before or after, courses of arsenical treatment; a certain amount of evidence in respect of this is found in the literature. Similarly; tryparsamide is more likely to produce ocular disturbance in cases previously treated with arsenicals, and there is evidence that its action in such cases is not so satisfactory as in previously untreated cases.

Finally, there is evidence that "Bayer 205" may effect a cure in cases of *T. rhodesiense* infection in the first stage not only in previously untreated cases, but also in cases which have previously received without avail large quantities of arsenic and antimony.

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MISCELLANEOUS.

CALCUTTA. **Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases for the Year 1924.** [MEGAW (J. W. D.), Director.] —pp. iii+92. With 19 figs. on 5 plates. Calcutta: Bengal Govt. Press. [For official use only.]

This Report contains a general review of the progress and policy of the School, by the Director, and 17 departmental reports by the several Professors and Researchers. It is replete with interest, though, of course, much of the result of the year's work, summarily reported, has already been fully published, mainly in the *Indian Medical Gazette* and *Indian Journal of Medical Research.* A list and titles of 48 such papers is included in the Report.

The chief adjuncts to the School during the year are an X-ray Department and a Pasteur Institute. Both of these have been at work for six months, and in the Pasteur Institute 1,461 cases were treated, of which 27 per cent. were jackal-bites, rabid jackals being extremely common in Eastern Bengal.

The most interesting item of the report of the *Kala Azar Research Department* is the story of the entomological survey that disclosed the fact that the kala azar parasite can transform into the flagellate phase in the fore and midgut of *Phlebotomus argentipes* after the insect has sucked the blood of sufferers from the disease. The survey included two districts of Calcutta, of which one is known to be an endemic focus of the disease and the other to be practically free from it, although patients brought from places up country for treatment had dwelt there from time to time. And here another interesting riddle was confronted: *Phlebotomus argentipes* was found in both districts where domestic animals (fowls, ducks, goats, cows) are kept and bare soil containing admixture of their faecal matter affords good breeding-ground. A possible explanation, based on certain facts of observation and experiment as to a particular preference shown by *P. argentipes* for bovine blood, is that the "non-endemic" area is inhabited by Hindu who keep only cows, whereas the domestic animals of the endemic area are ducks and fowls which do not thus divert the insect from man. In the treatment of kala azar, reports of good results with "Heyden 471" are continued, and encouraging prospects are reported from a limited experience of "Heyden 693" and Wellcome "stibamine glucoside." The number of in-patients treated during the year was 263, and of out-patients 16,833.

Great activity is reported by the *Hookworm Research Department,* much of it being of a confirmatory kind. Thus the passage of hookworm eggs unharmed through dogs and pigs, which, like many other animals (both domestic and wild) are steady consumers of the Indian village faeces, is confirmed. The superiority of carbon tetrachloride to oil of chenopodium for Necator is confirmed, and its great efficacy for threadworm and considerable value for Ascaris, also its uselessness against Trichuris, Strongyloides, and Tapeworm. Good work has been done in teaching doctors from tea-gardens, jute-mills, asylums, etc., the methods of diagnosis and treatment of ancylostomiasis.

The standard treatment here adopted is 70 minims of carbon tetrachloride emulsified in skimmed milk, followed in two hours by an ounce of saturated solution of magnesium sulphate.

The Report on *Research in Bowel Diseases* deals chiefly with cholera. Attention is drawn to the diagnostic value of "necrosed epithelial cells of the intestinal mucous membrane for which the cholera poison has a sort of selective action," in the stools, as being much more obvious to the search as well as more persistent in the stools than vibrions; also to cases of para-cholera of a benign type, in which "cholera-like vibrios" were found in the stools. Oral vaccination against dysentery was found not to elicit such a pronounced protective response as oral vaccination against cholera.

In the Report of the *Leprosy Research Department* treatment comes first. Undistilled esters, washed with weak alkali and dried, were found to be considerably less painful, cheaper, and probably more effective than distilled esters; undistilled hydnocarpus esters to be preferable to morrhuate esters; and pure oil of *Hydnocarpus wightiana* (from Ernakulum)to be less painful than esters of the same oil. Thymol, either by mouth or in oily injection, has been found useless, except when given dissolved in hydnocarpus esters. According to the experience of the outdoor leprosy clinic leprosy can be diagnosed without difficulty in the early stages, and when so diagnosed and thoroughly treated can be checked and—as far as any obvious signs go—cured, provided the patient maintains his natural resistance and his freedom from predisposing causes. The relation of leprosy to syphilis has been further investigated, the importance of preliminary anti-syphilitic treatment for all lepers giving the Bordet-Wasserman reaction being emphasized.

The work of the *Diabetes Research Department* on tests for recognizing the pre-diabetic stage, and on deterioration of insulin in the tropics, has already been noticed. Clinical experience with crude extract of telakucha (*Cephalandra indica*) has been "quite unsatisfactory" for the treatment of the disease.

In the Report on *Filariasis Research* the wide prevalence of the disease in Bengal is again noticed. Of 350 mosquitoes caught in human dwellings in different parts of Calcutta 2 per cent. (all "culicines") were found naturally infected.

In the *Public Health* laboratories the problems studied have been the working of various types of filters, the bacterial contents of condensed milk and tinned foods, the bacteriology of tube-wells, the preparation of neutral soap, and the detection of adulterations in *ghi*.

In the *Chemistry Department*, besides analysis of drugs (including indigenous drugs), a good deal of work was done in connection with the therapeutic study of leprosy, beriberi, and cinchona.

In the Report on *Tropical Medicine* interesting items to note are (1) the progress of a survey of the distribution of diseases, and (2) the fact that in the physician's wards in the hospital annexe every patient, whatsoever his disease, undergoes a routine of standard tests for evidence of past or latent infections. In the application of this routine overlooked syphilis, of course, is very commonly revealed, and the Widal routine has indicated that a large proportion of the population of Bengal has probably suffered from typhoid fever in childhood, and [? or] that Widal tests as ordinarily carried out are not satisfactory evidence that a fever is really typhoid.

The Report that includes *Pathology* contains, besides résumés of papers dealing largely with the endocrine defence already published (and already noticed in this *Bulletin*), a survey of over 2,000 cases of disease of the skin, most of them common enough. Thirteen per cent. were leprosy, and Major ACTON emphasizes the necessity of teaching the practitioner to recognize these skin lesions that occur in the initial stages when the cure of leprosy is possible. Attention is drawn to thyroid deficiency and other components of the endocrine defence as contributory factors in certain forms of skin disease.

The Report of the *Protozoologist,* Major KNOWLES, overflows with interest. Systematic routine studies--that certain method of what the immortal MANSON called "stumbling on a fact with a distinct bearing on human pathology"—have been maintained not only in malaria and amoebic dysentery, but also on the protozoa of local rats and, generally, on the mammals and birds dying in the Calcutta Zoological Gardens. In the studies of kala azar (1) the thick film method now practised has given positive disclosures in 67 per cent. of the Calcutta cases (against 19 per cent. in thin films); (2) the search for a laboratory animal susceptible to experimental infection—particularly monkeys deprived of the thyroid gland—has given merely a glimmering of hope; and (3) "brilliant green" has proved so toxic to animals as to preclude its use for man. In the treatment of amoebic dysentery (1) stovarsol—4½ gr., with food, twice daily, for a term of 10 days—has accomplished what appears to be an "absolute cure" in the five cases (of which three had long resisted emetine) in which it was tested; and (2) extract of kurchi bark, 60 gr. daily, was followed rapidly by the disappearance of two acute infections in which it was tested. Among other matters Major Knowles reports (1) an exhaustive, but unsuccessful, search for an associated organism in two cases of infantile cirrhosis of the liver, (2) the detection of leptospira-like artifacts in the blood of two cases of blackwater fever, and (3) a case of rat-bite fever in a European, in which *Spirillum minus* was isolated.

Major CHOPRA'S *Pharmacology* Report is extremely interesting. The study of indigenous drugs has been continued, and in collaboration with Major ACTON some stimulating investigations of the arcana of pharmacological processes has been carried on.

The Report of the Professor of *Serology* is prolific in practical interest. The practical value of blood-grouping in transfusion, the value of specific precipitin antisera in the precise identification of the stomach-contents of blood-sucking insects, and the detection and treatment of syphilis as an essential preliminary to the treatment of leprosy are among the subjects included. A great deal of experimental work has been carried on in respect of the value of the Wassermann test in malaria, and on flocculation syphilis tests.

The concluding Report, on *Medical Entomology,* consists of a summary of a large amount of varied work, including, among other things, observations on malaria in the Naga hills, malaria surveys and anti-malaria operations on tea-gardens, the action of larvicides, the pathogenic implications of ticks, the vesicant properties of certain insects, the herpetomonads of Lucilia, and observations on certain species of Anopheles.

A. Alcock.

ROSENAU (M. J.). **The Seasonal Prevalence of Disease.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 28–55. [16 refs.] [United Fruit Company, Boston, Mass.]

A formal paper on seasonal prevalence of disease—a subject at present so unripe in itself and so insufficient in its statistical roots—must be either trite and destitute of interest or—if, as in the present case, it deals with intricacies of causation—discursive, and its interest, which will be mainly suggestive and stimulative, must considerably evaporate in the process of abridgment. One valuable general statement, however, may be quoted in full, namely that "Generalizations concerning seasonal prevalence are hazardous, for each particular infection has its own vagaries. Each disease must be studied in and out of season. Its prevalence may then be correlated with other factors in order to get a true epidemiological picture."

The paper opens with some instances of periodicity of epidemics. Such as BROWNLEE's observation of recurring waves of influenza at intervals of 33 weeks provided the 33rd week does not fall between June and December - or, if it do so fall, then in multiples of 33 weeks: the exacerbations of measles every 2 or 3 years: the tendency, in Massachusetts, to an excessive prevalence of infantile paralysis every 4th season: the "irregular periodicity" of epidemics of plague in London between 1563 and 1680.

Going on to seasonal prevalence of disease, the author illustrates the obvious insufficiency of an explanation that attributes it to the direct effect of weather and climate. Measles, influenza, and smallpox do not wait for cold weather when introduced among a susceptible population. Some contact diseases prevalent in temperate climates tend to die out if introduced into the tropics; but others, such as common colds, influenza, pneumonia, and tuberculosis, do not.

The author classes diseases according to seasonal prevalence in three groups insect borne, intestinal, and respiratory—[a pardonable cross-classification in a subject so full of elusion and confusion]. Insect-borne diseases naturally prevail during the summer season. Typhus is an exception [not as the author opines because lice are any less common in the tropics and warm weather than in temperate regions and cold weather, but rather, one may suppose, because the louse is a specifically adapted parasite and its unvarying "climate" is supplied by its specific host]. The winter malaria of Russia in recent years is another exception, since in a warm hut inhabited by Russians and provided with a water-butt Anopheles is independent of vicissitudes of climate.

Intestinal diseases -typhoid fever, cholera, dysentery and the summer diarrhoea of infants—obviously have the same seasonal prevalence as insect-borne diseases. The only reason for separating them from the latter is that cholera and typhoid and dysentery may also be water-borne, and therefore are not restricted to summer.

Diseases of the respiratory tract are commonly attributed either directly to seasons of cold and changeable weather, or—being diseases that are supposed to be spread by contact through emanations from the mouth and nose—to the crowding that commonly occurs in such weather. But neither of these explanations will be found to be sufficient.

In the discussion of the causes of seasonal influence the author quotes WEBSTER to the effect that the equilibrium of an infectious disease in a given community is determined by "microbe distribution," "microbe virulence," and "host susceptibility." In his own language the amount of disease in a community naturally depends upon the amount of virus and the facilities for its distribution under favouring influences. Dosage—with which, of course, the question of virulence is implicated—is also an important factor. The influence of symbiotic associations of microbes must also be considered, particularly when it is remembered that common colds increase the number of pneumococci in the mouth and that scarlet fever seems to cause an increase of diphtheria bacilli in the throat.

As regards virulence, a number of diseases—yellow fever, smallpox, scarlet fever, infantile paralysis—show remarkable differences in severity at different times and places. In a study of 38 different epidemics of infantile paralysis occurring between 1894 and 1921 in different parts of the world—a total of 20,568 cases—AYCOCK and EATON found the case-fatality (averaging 20·8 per cent.) to range from a maximum of 30·7 per cent. to a minimum of 5 per cent., and to be rather higher in cold weather than in summer. (But here the want of perfection and the inequality of returns have to be remembered.)

Many diseases appear to follow the temperature curve so closely as to suggest a direct causal nexus between temperature and seasonal prevalence. Pneumonia is one of them, yet there is little of it among natives of the Arctic regions unless when they come to lower latitudes, and then they are especially susceptible; and again pneumonia is one of the principal causes of death among labourers on the fruit plantations of Central America. Influenza when carried to Greenland caused mortal havoc there, yet epidemics of it are frequent in the tropics. Scarlet fever, indeed, is usually high in the cold cities of America and almost unknown in the Panama Canal Zone; but measles though most prevalent in cold weather also occurs in warm countries, and diphtheria is prevalent both in cold and in warm regions.

High death-rates in spring may be a consequence of loss of resistance after the strain of winter. VAUGHAN suggests that it is not so much the cold of winter that affects us adversely as the way we defy the rules of hygiene and live in overheated buildings during that season. Physiologically, cold is invigorating and heat is depressing.

Besides temperature the potent effects of sunshine have to be considered. This influence is familiar in tuberculosis and in rickets. How insidious it may be is suggested by the fact that there are certain substances in buckwheat which are harmful to animals exposed to sunshine, but not when the animal is kept in the dark.

The effects of humidity one hardly needs to be reminded of, but how secretly and indirectly variations of atmospheric moisture may act is illustrated among the classical experiments made upon ALEXIS ST. MARTIN by BEAUMONT, who observed that a dry atmosphere increased and a humid atmosphere reduced the temperature of the stomach.

On the analogy of the hibernation and the rutting season of animals there is a number of physiological rhythms to be considered in our speculations on seasonal prevalence of a disease. Thus there are many insidious seasonal variations of metabolism, such as quicker growth of hair at certain seasons, and heightened capacity of the blood to fix CO_2 in the season of short days; seasonal variations in the size and weight of viscera, studied by BROWN, PEARCE, and VAN ALLEN; seasonal variations in the endocrine equilibrium, such as the hyperthyroidism said to occur in spring and autumn; subtle seasonal influences of diet, such as the heightened susceptibility of mice to certain poisons in the spring, and the spring outbreaks of pellagra following an unbalanced diet during winter; and the absence or diminution of antiscorbutic vitamin in the milk of stall-fed cattle in winter.

To sum up: in speculating on the seasonal prevalence of disease we have to keep in mind not only temperature, rainfall, air-currents, and sunshine, and variations in the virulence of a microbe, but also seasonal variations in resistance, manifold normal seasonal fluctuations of a physiological nature, seasonal changes in environment and diet.

In the discussion on the paper Sir A. NEWSHOLME referred to nonconformity of seasonal incidence of typhoid fever in different States of the U.S.A., compared with its uniformity in Europe; and to the definite correlation observed by LONGSTAFF between a succession of dry years and an excessive amount of erysipelas and scarlet fever and acute rheumatism. Dr. KOFOID reminded the audience that the cosmic forces which determine temperature, rainfall and access of solar radiation are correlated in an infinite variety of ways not only with the phenomena of seasonal incidence of disease but with the entire panorama of plant and animal life. Major DUNHAM referred to remarkable differences in the incidence of measles observed in concentration camps of different civic complexion. And Dr. F. L. HOFFMAN referred to the effects of coincident high temperature and high humidity on the incidence of infantine diarrhoea.

A. A.

CASTELLANI (Aldo). **Haemorrhagic Bronchites of Non-Tubercular Origin.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 857–901. With 17 figs. [85 refs.] [United Fruit Company, Boston, Mass.]

In this long paper the author systematizes his labours on bronchial inflammation of parasitic origin independent of the tubercle bacillus. He defines and characterizes broncho-spirochaetosis, broncho-amoebiasis, broncho-paragonimiasis, and twenty different specific forms of broncho-mycosis, each named from its corresponding fungus. The history of his discovery of broncho-spirochaetosis is given at some length and with illustrative cases. Clinical illustrations of broncho-nocardiasis and broncho-moniliasis also are given. The author emphasizes the practical importance of the differential diagnosis of all these different kinds of bronchitis, since they are generally mistaken for tuberculosis, and if a timely and correct diagnosis be made they are amenable to treatment.

A discussion followed in the course of which Dr. FACIO described a case of broncho-spirochaetosis, in which the distressing symptoms of bronchitis were cured by neosalvarsan, although spirochaetes could be found in the sputum two months afterwards. Colonel ASHFORD related a case of broncho-moniliasis, with pulmonary abscess and pus that gave an almost pure culture of monilia, which was rapidly cured as soon as the patient was treated with monilia vaccines. Dr. CLARK, although anxious not to be understood as impugning the occurrence of primary bronchomycoses, had himself not seen that condition unassociated with tuberculosis. Sir T. OLIVER questioned whether the bronchitis is primary or secondary. He referred to the fact that if finely divided aluminium ore be injected into an animal, intravenâ, phagocytes loaded with the particles can be observed passing from the pulmonary capillaries into the alveoli and thence into bronchioles, where they accumulate along with mucus as in a secondary bronchitis. In concluding the discussion the author considered it to be most important to distinguish between primary and secondary broncho-moniliasis: in the primary form the isolated monilia will be virulent to a rabbit when injected intravenâ, and will produce a characteristic nodulation of the lungs when injected there.

A. A.

BEECHE (Luciano). **Tropical Diseases of Costa Rica.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 573–580. [United Fruit Company, Boston, Mass.]

Prior to the year 1900, the author writes, the year in which the United Fruit Company fully organized its operations in Costa Rica, the Atlantic Coast and its natural outlet, Port Limon, were an immense swamp, where yellow fever and malaria destroyed hundreds of people year after year. Thanks to the Company, " the former dominions of death have been gradually converted into centres of activity and life." Yellow fever afflicted the Pacific littoral till 1903; since 1910 the disease has not occurred in the country. Malaria tends to increase. In 1914-18 it killed 3·14 per mille; in 1919-23, 4·89. The increase is attributed to the bad state of the privies built under the instruction of the Department of Ankylostomiasis. Blackwater exists in the most malarial districts. Sprue is found in the entire country, but especially in the cities: brilliant results in treatment have been obtained by the elimination from the diet of starches and sugars. Dysentery, chiefly amoebic, is endemic. Half the population is affected by hookworm. There are 40 cases of leprosy in the lazaretto. Some account is given of the sanitary organization.

A. G. B.

MÜHLENS (P.). **Short Remarks about some Tropical Diseases in Argentine.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 547–552. [United Fruit Company, Boston, Mass.]

In April, May and June the author, with three Argentine doctors, studied the diseases in the provinces of Tucuman, Salta and Jujuy, in the north of the Argentine Republic. Blood preparations from 7,000 persons were examined, and of 7,024 slides (thick film), 2,331 were positive.

800	(34·3 per cent.)	were	*Pl. vivax.*
580	(24·9 ,, ,,)	,,	*Pl. malariae.*
871	(37·4 ,, ,,)	,,	*Pl. falciparum.*
80	(3·4 ,, ,,)	,,	Mixed.

P. falciparum was found in high percentage up to 1,200 metres. The chief carrier seems to be the widespread *Anopheles pseudopunctipennis.* A " large number " of persons had splenomegaly, but blood parasites could not be demonstrated.

Microfilariae were found in the same area, in some regions up to 48 per cent. of cases examined, and also among Bolivians, but the author could not make out a definite clinical picture of disease. It has no periodicity, and is either *Mf. demarquayi*, or a new parasite [see this *Bulletin*, Vol. 10, p. 122]. Of 219 cases studied, more than half were in children under 15.

Two cases of infection with *Schizotrypanum cruzi* were seen in Tucuman and Jujuy; Triatoma is numerous and goitre and cretinism are not rare: in some places 40 per cent. of people were goitrous. KRAUS and ROSENBUSCH were unable to find any human cases of trypanosomiasis [*loc. cit.*, Vol. 11, p. 166]. In the first case, a child of 5 months, numerous trypanosomes were seen in thick blood films on three occasions. Quinine was given for malaria and thereafter parasites were not demonstrable, and inoculation of animals was negative. The second case was in a child of about eight years. Here the parasites were sparse, about one to a film. After ten days' negative examinations, a mouse was successfully inoculated with 1 cc. of blood. Four *Triatoma infestans* taken from the house of the first case infected a guineapig on which they fed. The first child had a chain of symptoms which might have been due in part to malaria. In the second there was no apparent deviation from health, except that the spleen and cervical glands were slightly enlarged.

Other diseases seen and briefly mentioned were cutaneous leishmaniasis, espundia, mal de caderas, typhus, granuloma venereum, leprosy, plague, amoebic dysentery, ankylostomiasis, and some cosmopolitan affections.

Dr. CARTER remarked that in California and in Panama *A. pseudopunctipennis* is not an efficient carrier of malaria.

A. G. B.

ZUBIETA (Ernesto). **The Gorgas Memorial Institute of Tropical Medicine.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 962–969. [United Fruit Company, Boston, Mass.]

The site for the Gorgas Memorial Institute of Tropical Medicine, given by the Panama Government, is alongside the new Santo Tomas Hospital, which is now near completion at a cost of 3,000,000 dollars, and is to house 750 patients. For the perpetual endowment of the Gorgas Institute 6,000,000 dollars is being raised by public subscription in the U.S.A., and Central and South America. The functions of the Institute are to be research, post-graduate study and "the preparation and intelligent distribution of scientific literature to investigators and research workers throughout Latin-American and other countries of the world."

A. G. B.

DUNHAM (George C.). **The Work of the Medical Department, United States Army, in the Tropics.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 971–978. [United Fruit Company, Boston, Mass.]

There are two passages of general interest in this paper, one giving a fresh illustration of the effect of modern means of transport on the spread of disease. The dengue problem in the Southern States has been complicated by the rapid increase in the number of travellers by motor car. Many make long cross-country journeys, camp by the wayside, are infected with dengue by the local mosquitoes, and carry the infection hundreds of miles further, where they infect other mosquitoes.

With the object of ascertaining whether tropical climate affects mental efficiency :—

"The Medical Department Research Board is now endeavouring to determine whether the officers serving in the Philippine Islands are affected adversely by the tropical climate. Within the last year, other boards have been appointed in Panama and in Porto Rico to study this question. It is proposed to study the comparative mental efficiency and physical health of officers while they are in the Tropics, and prior and subsequent to such service. These investigations must extend over a number of years, but it is believed that the data obtained will be of value in determining the effect of tropic residence upon mental and physical efficiency."

A. G. B.

HORN (A. E.). **Some Aspects of Tropical Medical Work.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 556–566. With 1 fig. [United Fruit Company, Boston, Mass.]

A discursive and interesting paper, in which the author ranges from malaria prevention and treatment, water supplies in the rural tropics and their protection from mosquitoes, to yellow fever in West Africa. Incidentally, he calls attention to the value for subsoil drainage of perforated cigarette and milk tins placed end to end or waste sheets of corrugated iron arched and buried end to end where a costly scheme is inadmissible, such expedients having the added merit that they dispose of useless rubbish, which itself may be the means of mosquito breeding. FLETCHER'S unfortunate results with intrarectal quinine are described at some length [but NEWHAM'S long experience to the contrary is not mentioned (this *Bulletin*, Vol. 20, p. 970–1)]. The author describes and figures his anti-mosquito device for rain-water tanks or casks [*Supplement* No. 3, 1924, p. 181]. In the long discussion which followed LE PRINCE drew attention to the value of a horse for demonstration of Anopheles, where householders are sceptical as to their presence, to the repellent effect on Anopheles of a certain high candle power of light, to the value of swatting, and to the increased duration of screening when Monel metal is used in preference to copper bronze. Both paper and discussion should be read.

A. G. B.

DEEKS (W. E.). **Activities of the Medical Department of the United Fruit Company.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 1006–1010. [United Fruit Company, Boston, Mass.]

Dr. Deeks tells the story of the development of the Medical Department of the United Fruit Company. As he writes, "the record of industrial progress in the Tropics is really the record of medical and sanitary progress, for agricultural development and commercial activity on a large scale are impossible until medical science brings tropical disease under control, and sanitation transforms pestilential areas into healthy localities." For this reason a Medical Department was created on the incorporation of the Company in 1899, and to this its commercial success is largely due. Its plantations cover 2,000,000 acres of land, and it owns or leases 3,000 square miles. It employs about 67,000 persons, and no less than 150,000 are dependent upon it for medical service. It has eight large modern hospitals, handling 28,000 patients yearly, while ten times as many are treated at its dispensaries. The quarters of the employees are modern and are under constant sanitary supervision. It has built and maintains schools, churches and places of entertainment and recreation, as well as merchandise departments, hotels, laundries, and even ports with docks and warehouses. The annual expenses of the Medical Department are about a million dollars, and half that sum in addition is spent on sanitation. It maintains a free Radio-Medical Consulting Service, used by merchant ships. The Company operates a fleet of 80 steamers, specially built and designed for tropical service; all are rat-proofed and kept in a sanitary condition under the supervision of the Medical Department. The work offers unusual opportunities for the study of tropical problems and scientific workers are welcome. Desire for efficiency prompted the Medical Conference in the Proceedings of which this paper is published.

A. G. B.

HOFFMAN (Frederick L.). **The Problems of Mortality and Acclimatization in the Central American Tropics.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 657–678. [United Fruit Company, Boston, Mass.]

By the Central American Tropics the author means the West Indies and the north coast of South America. His standpoint is shown at once in the statement: "The enormous improvement in the health of our southern states during the last generation bears evidence to the truth of the theory that the earth, as modified by human action, can be made habitable and useful for the needs of man when necessity requires, wherever that region may be located, be it in the sub-Tropics, the Tropics, or, for that matter, in the sub-Arctic or the Arctic." He draws attention to the neglect of the study, by modern methods, of the disease-predisposition of races. He gives statistics of the personnel and medical activities of the United Fruit Company for 1923, including the causes of death of white employees, and tabular statements of the incidence of malaria and dysentery over a series of years. He notes that the cancer rate over four years is about one-fourth of that in the United States [but does not say whether the figures are corrected for age distribution]. In this connexion he seems to attribute importance to the use of canned food.

Similar figures are given for the Panama Zone, including a return which is of great interest—the causes of death of white American employees arranged with reference to age and length of residence on the isthmus between January, 1914 and December, 1923. Of the 98 deaths which occurred in this ten-year period only five were from a tropical disease, in each case malaria. This, as the author says, conclusively proves the relative infrequency of typical tropical affections. The average age at death was 46·1 years and the average length of residence 9·4 years; the longest residential periods were 35 and 23 years. "The strictly tropical affections on the Isthmus of Panama are no longer a matter of serious concern to those who adopt reasonably sanitary precautions and habits of life conducive to health and longevity." The author from his own experience and investigations feels satisfied that the attainment of normal longevity is not difficult provided the person concerned maintains industrious habits and keeps steadily at work. The things to be avoided are—idleness, excess of intoxicating liquor, venereal disease, parasitic infections such as hookworm and malaria. He considers that the United Fruit Company is conducting a most promising experiment in tropical acclimatization. The majority of the employees are entirely satisfied with their tropical surroundings; and here it must be noted that various and close contacts with the outside world are maintained by wireless telegraphy, and those who are ill or in need of a change of climate are transported back to their homes. Finally, he thinks that medical science should attempt more precisely to define the types of mankind ill-adapted to prolonged tropical residence and continuous heat exposure.

Colonel Bailey K. ASHFORD discussed the prevalent " chronic fear " of the tropics, the incapacity for adaptation to the environment, the nostalgia, the lack of fresh food, the want of sufficient rest ; he laid special stress, as did H. R. CARTER, on the necessity for regular exercise. He believes that, given a fair sanitary service, the American tropics are less fearsome from the point of view of disease than the north.

A. G. B.

TODD (John L.). **Tropical Medicine, 1898-1924.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 17–27. [United Fruit Company, Boston, Mass.]

A stimulating address. " The history of tropical medicine from 1898 to 1924 should inspire in man a sturdy belief that concerted and organized endeavour can solve the most difficult of problems." Professor Todd believes that instruction in tropical diseases should be given to all students of medicine because of the importance of " familiarity with diseases that are definitely diagnosed by seeing their cause and are cured or prevented by destruction or circumvention of that cause " ; because a knowledge of these diseases is necessary to an alert and comprehensive understanding of human pathology ; and because the " time-size " of the world has become so small, *e.g.*, a few days may bring to hospitals in temperate climes patients from Tropical America or Africa. The Association of American Colleges has added to the medical curriculum 40 hours' instruction in medical zoology. [If " before the great war neither the cause nor method of infection of typhus was known," it only shows how slowly knowledge of such fundamental work spread at that time, for louse transmission was made known in a series of papers by NICOLLE and others from 1909 onwards (*see* NUTTALL, *Parasitology,* Vol. 10, p. 43).]

A. G. B.

MOODY (L. M.). **Some Notes on Alastrim.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 760–767. [United Fruit Company, Boston, Mass.]

An excellent paper the substance of which has been published and reviewed in this *Bulletin* (Vol. 19, p. 438). The author is disposed to regard smallpox and alastrim as distinct owing to the slight constitutional symptoms in alastrim, the character and course of the eruption and the low mortality ; moreover, the vaccination reactions and histological appearances differ. A discussion followed.

Dr. ROSENAU believes that alastrim "is no more nor less than smallpox," because "smallpox is a disease which presents mutations and variations more than any other disease we have to deal with;" the difference between alastrim and smallpox is one of degree rather than kind; in every epidemic there are extremely mild smallpox cases; since the Spanish war there has been smallpox in the U.S.A. with mortality of less than 0·5 per cent. Just so, the mortality from yellow fever may vary from 37 to 5 per cent. The main thing is that vaccination protects. A separate name serves to diminish preventive measures; he would like to abolish the word alastrim. Dr. Aristides AGRAMONTE takes the same view. He has stamped out the disease in Cuba by vaccination. Dr. William H. PARK presented the analogy of typhus in America—the endemic form, always mild, so that no serious efforts are made to eradicate it, and the imported form, very infectious, with a high mortality, frequent 30 years ago. Dr. CASTELLANI inclines to think that alastrim and smallpox differ, but Dr. Moody clinches the argument of the other side when he expresses the opinion that if alastrim had been regarded as smallpox in Jamaica it would have been stamped out long ago because of the terror that smallpox has for the people.

A. G. B.

CORREIA (Alberto Çarlos Germano da Silva). **A variola em Angola.**—*Revista Méd. de Angola* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 423-460. [2 refs.]

This contribution is divided into three parts. The first gives a statistical account of smallpox in Angola from the time of the very fatal epidemic in 1864, when nearly 15,000 were attacked and fully half this number died, down to recent days. Part II deals with prevention by vaccination and with arrangements for preparing the supply of lymph at a Vaccinogenic Station at Huambo. The final section details the projected personnel and arrangements to be put in force at this Station and for seeing that distribution of the lymph is maintained and that a certain reserve is always kept for epidemics and suchlike times of stress.

H. Harold Scott.

VAN HOOF. **Varioloïde et Alastrym au Stanley Pool.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessoes.) 1923. Aug. No. 4. pp. 461-470. With 5 plates. [12 refs.]

The author discusses anew the question of the identity or otherwise of varioloid and alastrim. In his experience, vaccine lymph produced little, if any, immunity to alastrim. He was unable to communicate alastrim to monkeys by inoculation of the contents of pustules from a case of this disease, though success was readily obtained with vaccinia. The following experiment is of interest. Scarifications were made on various parts of the skin of a small cercopithecus. When these were nearly healed and showed merely local congestion 1 cc. of the contents of a pustule [the nature of the virus is not stated] diluted in normal saline was injected intravenously. Eight days later a typical eruption appeared in the scarified regions. Two others similarly injected but not previously scarified yielded negative results. [Cp. LEVADITI & NICOLAU, this *Bulletin,* Vol. 20, pp. 680–681.]

The author suggests that, though perhaps not now identical, variola (or varioloid) and alastrim may have a common ancestry.

H. Harold Scott.

ROBINEAU (Marcel). **L'alastrim, quelques remarques cliniques. Ses rapports avec la variole.**—*Rev. Méd. et Hyg. Trop.* 1925. Jan.-Feb. Vol. 17. No. 1. pp. 5–12. With 6 charts. [2 refs.]

On April 14th 270 tirailleurs, recruits from the Upper Volta and French Guinea, reached Arles on the Rhone. The next day one of them presented a general eruption recalling smallpox but was not otherwise ill. The eruption had appeared a week earlier and at Marseilles he had hidden himself to escape detention. He and the rest had been successfully vaccinated 5 months before. This was the first of an epidemic of 59 cases which was closely observed by the author. The incubation period was 14 days. The early symptoms were headache, sometimes backache, and frequently a dull pain on palpation of the spleen, which, however, was not enlarged. Vesicles appeared the next day, first on the superciliary ridges, cheeks, and flanks; each was surrounded by an inflammatory zone, 1–1·5 cm. in diameter. There were sometimes pains in the course of the subcutaneous nerves like those of shingles. The temperature was 39 to 39·5°. There was often an eruption of red points on the soft palate and mucosa of the cheeks. Next day, fever, areola and general symptoms disappeared. The eruption occupied the entire body, including the hairy scalp, but vesicles were never seen on the palms and soles: the author believes they occur here only in confluent cases. Umbilication and pustulation occurred about the 7th day. Desiccation was rapid, and the blackish crusts fell after 8–10 days leaving a depigmented cicatrix. The total duration was 20–22 days.

The mildness of these cases is attributed to the recent vaccination. Two who had escaped were vaccinated on the 15th day of their disease; the reaction was slight and no lymph was formed. It is concluded that previous vaccination attenuates the virulence of the alastrim virus without conferring absolute immunity, and that the alastrim virus develops antibodies early which attenuate the vaccinal reaction. Several patients had a recrudescence of fever, seen in 2 charts, seven days from the onset, when the vesicles suppurated. That the disease is infective only at an early stage is shown by the fact that the patients were frequently found in a ward reserved for other cases, but none of these became infected, whereas it spread in the battalion though the patients were removed at once on diagnosis. Men were returned to duty as soon as the crusts had fallen.

A. G. B.

NETTER (Arnold) & URBAIN (Achille). **Déviation du complément dans la variole et l'alastrim. Relation entre les deux maladies.**—*C. R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 952–954. [1 ref.]

This paper contains the details of a comparative study of the deviation of the complement in alastrim and smallpox. The alastrim serum was obtained from 19 recovered cases from an outbreak among native [colonial] troops stationed at Arles; the variola serum from 6 convalescents from a very dangerous outbreak (40 per cent. mortality) at St Malo. The serum of all these cases was tested with vaccine antigen; and in 18 cases was also tested with antigen from varicella crusts. The author's conclusions from the constancy of the results throughout are in favour of the view that alastrim and smallpox are attributable to the same origin; and that there is reason to think that the variola virus has undergone in alastrim a mutation of the same order as occurs in vaccine. "One could not affirm that this mutation must remain definitive."

A. A.

LANE (W. Arbuthnot). **The Causation of Cancer.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 744–751. [United Fruit Company, Boston, Mass.]

Part of this paper relates to the inhabitants of the tropics [what part is not stated, but the "black man" is mentioned]; with the rest we are not here concerned. A few extracts will give the author's views.

"The native only too readily imitates the universally faulty diet and habits of the white man. In consequence, he of necessity acquires the abnormal conditions and the diseases resulting from this intimate and unfortunate relationship with the white man which has been forced upon him. . . .

"Finally that dread scourge of civilization, cancer, attacks the poor black man with a frequency proportionate to the degree of his civilization . .

"Such is the appalling price the native pays for civilization. . . .

"It is absolutely certain that, owing to the perfect functioning of his stomach and intestines because of his simple diet, the native in his normal surroundings does not suffer from indigestion, appendicitis, colitis, gastric or duodenal ulcerations, or from cancer of the gastro-intestinal tract or any organ in his body; nor is he subject to the many degenerations of the several tissues and organs of the body, all of which are in effect symptoms of chronic intestinal stasis and not independent diseases.

"It is only when the vitality of the tissues is sufficiently depreciated by the poisons which are absorbed from the infected intestinal contents and are circulated through the body, that cancer is ever developed."

[The assumption that cancer is a disease of civilization is unproven (see ROGERS: SNIJDERS and STRAUB, Vol. 21, p. 906; in both of which papers there is evidence that cancer is at least as prevalent in the uncivilized Asiatic as in Europe).]

A. G. B.

WELLS (C. R.). **Betel Nut Chewing and its Effects.**—*U.S. Nav. Med. Bull.* 1925. Apr. Vol. 22. No. 4. pp. 437–439.

The author, Lieutenant, Dental Corps, U.S. Navy, describes the effects of betel nut chewing in Guam thus:—

"The soft tissues of the oral cavity, and especially the gingivae, are the parts adversely affected by betel nut chewing. . . . These changes involve at first a slight gingivitis, followed by the accumulation of heavy deposits of salivary calculus. Some pain is experienced with the early gingivitis, but this subsides without treatment and a chronic gingivitis follows. There is a gradual recession of the gingivae, with the formation of pockets, and the deposition of serumal calculus beneath the free margin of the gums and of black concretions from the betel nut on the necks of the teeth. The gums become soft and spongy, bulging about the teeth and bleeding easily. The alveolar process soon becomes affected and breaks down, leaving ragged spicules which constantly irritate the tissues. The teeth loosen, appear to be elongated, and are sore while in use. At about this time, true pericementitis develops and the native begins to appreciate his dental troubles. . . . Finally, his pain becomes unbearable and he seeks the hospital. His teeth are now candidates for the forceps and his oral tissues require careful attention, since nearly all of the alveolar process and the peridental membrane have been destroyed."

The author finds that few confirmed chewers have carious teeth, though the natives have accepted American foods with avidity and have discarded as far as possible the coarse foods of their ancestors, but extensive caries has been seen in children who do not chew. The teeth in habitués are coated with heavy concretions, which mechanically prevent the attack of decalcifying acids and the ingress of infectious organisms, and to this or to the alkaline secretion of the mouth may be attributed the absence of caries.

The author has never observed " in the hundreds of betel nut chewers who have been treated " any evidence of cancer of the mouth, nor does he mention any changes in the buccal mucous membrane. [See this *Bulletin*, Vol. 21, pp. 327 and 909.]

A. G. B.

FISCHER (Walther). **Der Speiseröhrenkrebs bei den Chinesen und die Ätiologie dieses Krebses.** [Oesophageal Cancer in Chinese and its Etiology.]—*Klin. Woch.* 1924. Dec. 9. Vol. 3. No. 50. pp. 2288–2289.

It has been asserted as an example of irritation cancer that the Chinese men eat their rice as hot as possible, and the women later when it is cold, and that the men and not the women suffer from cancer of the oesophagus. The author has been unable to discover the grounds for this statement. His enquiries show that cancer of the oesophagus is from twice to twelve times as common in men as in women in Europe and America, that there is no evidence of excessive frequency of oesophageal cancer in China, that neither in North or South China is the male favoured in the serving of rice, and that rice is never eaten very hot. In short, he shows that the statement is without foundation.

A. G. B.

WATKINS-PITCHFORD (W.). **The Prevalence of Cancer amongst the Native Races of Natal and Zululand during the Four Years, 1906-1909. With a Note on the Nature of Cancer.**—*Med. Jl. S. Africa.* 1925. Apr. Vol. 20. No. 9. pp. 257–260. [1 ref.]

A " Cancer Research Committee " was formed in Natal in 1905. It met twice and issued two reports, the last in 1910. This is now inaccessible and is therefore embodied in the present paper. Enquiries were made of medical practitioners in Natal and Zululand, magistrates, who receive reports of death, and health officers. It is noted that whereas 25·7 per cent. of the population of England and Wales were of the age of 40 and over, only 13·7 per cent. of the natives had reached that period. In these four years there were eight fatalities from malignant disease and 19 laboratory diagnoses, a total of 27, making a death rate of 0·72 per 100,000 per annum. The author holds that the small figure is not explained by imperfect opportunity for investigation, for " it is almost incredible that any natives who were the subjects of such visible, agonizing and slowly destructive diseases as cutaneous, lingual or mammary cancer would not have sought relief sooner or later at the hands of the white man " [as the author implies, this does not cover internal cancer]. The figures show that the negroes in South Africa are affected with sarcoma almost as frequently as with carcinoma, and that they exhibit a special liability to sarcoma of the subcutaneous tissue of the foot; of 11 sarcomata 4 originated at this site. He does not know whether pure-blooded American negroes who wear boots have a similar liability. In the same period there were received from domestic animals 6 malignant tumours (3 sarcoma; 3 carcinoma).

A. G. B.

BRADFIELD (E. W. C.). **Report on the Surgical Work at the Madras Government General Hospital, 1923.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 515–518.

In this report the following items seem to be of particular interest :—

Cancer.—The Cancer statistics for the five years 1919–23 are as follows, out-patients unfit for operation not being included :—

	Europeans.	Hindus.	Mohammedans.	Other castes.
Total admissions, all diseases	9,221	24,227	2,422	7,160
Total cancer cases	36	288	23	35
Percentage cancer cases ...	0·37	1·19	0·95	0·48

The incidence of cancer by site and race (or caste) for the year 1923 was as follows :—

	Hindus.	European & Anglo-Indian.	Indian Christian.	Mohammedan.	Other castes.	Total.
Tongue and floor of mouth ...	7	2	...	...	...	9
Jaws	13	...	...	1	2	16
Cheek	28	2	1	5	1	37
Lips	2	...	...	1	...	3
Breast	7	1	...	...	...	8
Penis	17	...	...	1	...	18
Uterus	1	...	...	...	...	1
Anus and rectum	2	1	...	...	1	4
Stomach ...	6	...	...	2	...	8
Intestine ...	4	...	...	...	...	4
Larynx	1	1	...	...	...	2
Gullet	1	2	1	...	...	4
Liver	2	...	...	...	1	3
Bladder	1	...	...	...	1	2
Skin	3	...	...	...	...	3
Other parts ...	3	...	...	...	...	3
Total ...	98	9	2	10	5(*sic*)	124(*sic*)

The large proportion of cancers of cheek is attributed to the custom of betel-chewing and to the coarse lime (*chunam*) ingredient of the quid; the average age of these *chunam* cancer cases was 44 years, the youngest being 35. The disease spreads widely, and ultimately the condition of the patient becomes very distressing and disgusting. In operation on mouth cancers the best procedure is to remove as much as possible—including the glands of the submaxillary triangle—with the knife, and to complete with free diathermic cauterization, using a button cautery and paying special attention to the area leading to the pterygoid region: a preliminary laryngotomy reduces the risk of bronchopneumonia, and shock is lessened by a preliminary injection of novocaine into the Gasserian ganglion—which also economizes general anaesthesia.

The average age of the cases of penile cancer was 54 years, the youngest being 40; it is safest to remove the inguinal glands at the primary operation, since otherwise the disease recurs oftener than was once supposed.

Liver Abscess. The routine treatment now is aspiration followed by a course of emetine. Of 33 cases so treated in 1923 only 2 died (mortality 6 per cent.), and these were unusually complicated cases. In the 10 years (1912–21) before the adoption of this treatment the mortality in 171 cases submitted to operation was 18 per cent. Of 11 cases treated by aspiration and emetine by the author himself, 5 were cured after one aspiration, 3 after two aspirations, 2 after three, and 1 after four. The danger with Indian patients is that the improvement is so rapid as to satisfy them that they are cured and to delude them into leaving hospital prematurely - only to return later.

Gastric and duodenal ulcer are much prevalent. In 1923 no less than 226 operations were performed for these diseases. The author himself treated 50 cases (duodenal ulcer 46, with 3 deaths; gastric ulcer 2; and cancer of the stomach 2, with one death) of which 3 were Indian Christians, 3 Mahommedans, and the remainder Hindus.

A. A.

BRAITHWAITE (E. C.). **Four Cases of Carcinomata in Africans.**—*Nigeria Ann. Med. & San. Rep. for the Year 1923.* Appendix IV. pp. 36–39.

The cases were: Epithelioma of the leg at the site of an ulcer; epithelioma of penis; malignant adenoma of rectum; scirrhus carcinoma of stomach. These were seen in 6 months and the diagnosis confirmed, after operation in 2 cases and autopsy in 2, at the Medical Research Institute.

A. G. B.

ROWNTREE (Cecil). **Causation of Cancer.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 28. p. 631.

Referring to kangri-burn cancer, which is considered to be a convincing proof of the "irritation" theory of cancer, the author suggests the possibility of a chemical origin. "Is it not possible that the constant baking to which the tissues are subjected results in the production of some chemical agent comparable in its effects with the soot, tar, oil, etc., now so firmly established as the causes of their specific cancers?"

A. G. B.

SANARELLI (G.). **Sur les vaccinations par voie nasale.**—*C.R. Soc. Biol.* 1924. Dec. 19. Vol. 91. No. 36. pp. 1302–1304.

The author gives brief details of the immunity produced by nasal inhalations of powdered vaccines in rabbit and man in enteric, cholera, and bacillary dysentery infections. Boric acid 3 gm. and powdered lactose, 7 gm. are mixed with cultures grown on agar and killed by toluol, and the whole dried in a current of dry air at 52°. These vaccines blown into the nostrils of rabbits produce a solid immunity against the three diseases mentioned ; not only is the agglutination titre of their blood high but they resist lethal doses of virulent bacilli injected into their veins. Here the effects in man will be briefly stated. Antityphoid vaccines given in this way provoke regularly the appearance of agglutinins in the blood. The titre may be equal to, or even higher than, that obtained by the subcutaneous method with commercial vaccines. The results of anticholera vaccination are less constant, but subcutaneous vaccination in this disease has also inconstant results ; if the snuff contains antityphoid as well as anticholera vaccine, anticholera agglutinins appear promptly and in greater abundance. In man vaccinated with anti-dysentery snuff the agglutinins make their appearance slowly to reach a titre of 1 : 50; here, again, only when antityphoid vaccine is given concurrently.

A. G. B.

OTTEN (L.). **Vaccinatie per os.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 940–977. [17 refs.]

Otten offers ample criticism of BESREDKA's experiments on, and VAILLANT's practical application of, oral vaccination in man, the argument of which cannot be summarized in detail. His conclusions are the following :

1. The experiments of BESREDKA are incomplete and do not constitute a sufficient base for the practice of oral vaccination in man.
2. The question of local immunity of the intestine is not merely of theoretical interest but also of practical importance in view of the pathogenesis of acute infectious intestinal diseases.
3. BESREDKA's principal argument, the decrease and disappearance of antibodies from the blood after repeated oral vaccination, is not supported by the experimental results of other authors.
4. Also, the statistical data available, especially those of VAILLANT, are absolutely insufficient to prove the value of oral vaccination, let alone to make comparison possible with the value of the subcutaneous method.

W. J. Bais.

TYAU (C. H.). **The Value of Post-Mortem Examination.**—*Nat. Med. Jl. China.* 1924. Dec. Vol. 10. No. 6. pp. 361–369.

These judicious exhortations on the value of post-mortem examination are very appropriate, since in Eastern countries this perennial root of the tree of knowledge is still insufficiently cultivated. The author gives three illustrations of its value in correcting a diagnosis made in unpropitious circumstances during the patient's life.

A. A.

i. DE BOER (H. S.). **A Survey of European Children of School-going Age attending Schools in Nairobi, Kenya Colony.**—*Kenya Med. Jl.* 1924. Dec. Vol. 1. No. 9. pp. 265–269. With 2 charts.

ii. MACKINNON (M.). **European School Children in Kenya.** [Correspondence.]—*Ibid.* 1925. Feb. Vol. 1. No. 11. pp. 341–342. [1 ref.]

i. The author examined 262 children and tabulates the height, weight and chief defects for years from 7 to 16 of boys and girls separately. The average heights and weights of English children are *not* given, as is stated, for comparison. The tables show, the author explains, that children in Kenya are taller and heavier than children in Britain, that boys are taller than girls up to 7, are left behind at 9 and only regain their superiority after 14. Girls equal boys in weight at 8 and after that are heavier till 14. The greatest increase in weight in girls occurs between 10 and 11, and in height between 8 and 9, and 10 and 11. The increased height and weight of Kenya children are due to a better dietary than that of " board school " children in England. The author questions whether climatic conditions at Nairobi are not tending to develop girls too rapidly. Of the 262 children 24 per cent. had dental caries, but this percentage does not include those already treated ; 18 per cent. had enlarged tonsils or adenoids. Two enlarged spleens were found among 112 boys, a small number, for several came from homes " in what must be considered distinctly malarious districts."

ii. Commenting on de BOER'S observations and comparing them with his own, which concerned a larger number of Nairobi children [see this *Bulletin,* Vol. 20, p. 915], the author concludes that climatic conditions in Kenya exert an undue stimulating influence on growth and development in young children which has in course of time—after ten—a depressing influence and " is certainly injurious."

A. G. B.

VAN BERKHOUT (P. J. Teding). **Dosages du glucose, de l'azote non proteique, de l'acide urique et du phosphore-total, dans le sang chez l'homme sain, habitant les regions tropicales, et dans celui de l'oiseau dans l'avitaminose.**—*Reports of the Dutch-Indian Med. Civil Service.* 1924. Pt. 4. pp. 326–343. [48 refs.]

The chemical composition of the blood was studied in healthy Europeans and Malays in the tropics and in birds submitted to a deficient diet. The methods of determination are described ; the reducing power was studied in three ways. The conclusion reached was that in healthy men the determination of glucose, non-albuminous nitrogen and uric acid gave results not differing from those obtained in temperate regions, whilst the determination of total phosphorus gave a rather higher figure. In cocks in a condition of avitaminosis the content of the blood in reducing substances, non-albuminous nitrogen and total phosphorus did not differ appreciably from the normal values, but in pigeons in the same circumstances a pronounced hypoglycaemia usually became manifest. Those who are interested should study the tables.

A. G. B.

WATKINS-PITCHFORD (W.) & ALLAN (Peter). **An Investigation into the Significance of Localized and More or Less Persistent Râles in the Marginal Areas of the Lungs of apparently Healthy Natives.**—*Publications of the S. African Inst. for Med. Res.* 1924. Mar. 20. No. 18. 35 pp. [8 refs.]

" Defective Lungs " is the term used to describe a condition which has been a frequent cause of rejection of native applicants for labour in the mines in South Africa. Enquiry has shown that the expression implies a state " in which râles, usually finely crepitant in character, are detectable in the marginal areas of the lungs of apparently healthy natives who seem to be free from all other physical signs of disease." Between July, 1922, and June, 1923, 2,679 men were rejected by medical inspectors for this cause out of a total of 73,534 natives examined in British South Africa, and it appeared desirable that the real significance of a sign leading to the rejection of 3·5 per cent. of recruits should be investigated.

During the four months period April–August, 1923, a group of 113 recruits from amongst 980 men rejected on grounds of physical unfitness, were selected by the Depot Medical Officer as being more or less typical examples of " Marginal râles." One of these men proved to have a pneumonic condition and, in another, the râles disappeared, so that a total of 111 cases remained for investigation. The râles were, for the most part, unaccompanied by other signs of respiratory trouble, nor was a history of such present as a rule.

Twenty cases, however, had slight cough and 33 provided occasional samples of sputum described as " whitish " or " yellowish " ; none of these samples was found to contain tubercle bacilli. Pain in chest was complained of by 14 cases and corresponded in position to the râles in 10 of them. Eighty-nine cases were classed as being " within the range of normality " on radiological examination and, in 23, the X-ray films called for comment, a proportion such as might be expected in a group, 85 per cent. of which had already engaged in underground labour in the mines on former occasions. In two cases only were the appearances suggestive of early silicotic change, and, in them, the râles were not extensive, so that it does not seem probable that silicosis has anything to say to the production of the condition. In eight cases, the radiographic appearances were suggestive of tuberculosis.

The question of the association of these râles with tuberculosis had been, from the first, one of the most important points to be considered and these radiological findings were, therefore, of great interest. It was found that the Von Pirquet test applied to the group under investigation gave 92 per cent. of " positive " results, while a further group of 100 labour recruits, found free from râles and tested at the same time, gave 95 per cent. of " positives." The real test, however, consisted in passing the group on to work in the mines, a monthly medical examination being arranged for and also a final examination on the expiry of the term of employment. Of the eight men noted as having radiological signs suggestive of tuberculosis, two were rejected by the mine medical officers on other grounds so that only six of these went through the period of employment. Only three of the whole group developed tuberculosis during this period of hard work, and all three were amongst the cases in which the preliminary X-ray examination had been regarded as suggesting the possibility of infection.

It may fairly be concluded, therefore, that these " marginal râles " are not indicative of early tuberculosis infection, though, as the authors rightly add, they may sometimes " obscure the auscultatory signs of pulmonary tuberculosis." The investigation, in addition to establishing this important conclusion, goes further and shows that the râles are not to be taken as evidence of " defective lungs " nor to be regarded as in themselves a cause for rejection of native recruits for the gold mines. The period of employment, from two to six months, undergone by the test groups was followed, not by any undue percentage of disability, but by a general improvement in physique, and a tendency, in many cases, for the râles to diminish or disappear. The râles are regarded as "pleural in origin" and as probably resulting "from diminished lubricity of the serous surfaces." As the authors say, "there is no specific or constant association between the occurrence of marginal râles and the presence of, or predisposition to, any known disease. The phenomenon is, therefore, *sui generis*." These conclusions should be laid to heart by all whose duty it is to select native recruits either for the purposes of labour or of military service.

S. L. Cummins.

DIXON (W. E.); CHARLES (R. Havelock); POWELL (Arthur). **A Discussion on Drug Addiction in the Tropics. I. The Physiological Aspects of Drugs of Addiction** [DIXON]. **II. Some Clinical and Scientific Aspects of Drug Addiction in the Tropics** [CHARLES]. **III. The Association of Narcotics with Insanity and Crime in the Tropics. Observations on the Possibility of Addiction to Cocaine Substitutes** [POWELL].—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 249–265. [6 refs.] (Discussion pp. 266–275.)

Discussions in which all the terms are not rigidly defined and regulated remind one of Hobbes' simile of birds that, entering a chamber by the chimney, flutter in distraction at the windowpane for want of wit to find the way out again through the chimney. In such fluttering debate parties are apt to forget that "true and false are attributes of speech, not of things."

Much of the present discussion was of matter of opinion, and little of it was new. Professor Dixon defined drugs of addiction as drugs that are used either to produce sleep after preliminary stimulation, or to silence the higher faculties of mind and "leave the lower centres, so to speak, to run riot," and at the close he amplified his definition by stating that "the view of most neurologists at the present time was that, in European countries and America, people take drugs of addiction, and alcohol, to excess because they are psychopaths already."

Sir Havelock Charles, who spoke of opium as habitually used by multitudes of Indians, honourably and frankly admitted that his opinions on the subject were based not on science and logic, but on sentiment that may change without detriment to humane principle. In the pride of youth he was a stoic and had all a stoic's contempt for cakes and ale; so that, although he then lived among Indian soldiers, who had used opium from their youth up, and yet were brave, well-disciplined, and inured to very hard labour, he hardened his heart against that drug and would have forbidden it. The uncompromising stoicism of youth sometimes broadens down to a well-tempered benevolence; and we here find Sir Havelock Charles fully approving opium as used by the notoriously temperate native of India.

Dr. Powell, who spoke from long Indian experience of the abuse of drugs of addiction, said that the fakirs, sádhus, and bairagis—for the most part dissolute wastrels fit only for jail or asylum—were addicted to Indian hemp; also, that of 4,700 lunatics of whom he had knowledge 824 had a definite history of addiction to Indian hemp, and 40 to cocaine, but that not one among them all was an eater or smoker of opium.

Dr. GUINNESS, who had 27 years' experience as a medical missionary in China, spoke of opium smokers being willing to sell wife and family in order to procure opium, of opium-eating chairmen whose powers of endurance were much reduced, and generally of the shame and degradation associated with the use of opium both in fact and in Chinese public opinion.

Dr. SCOTT, who had two years' experience of China, stated that well-to-do Chinamen who smoke opium much as Europeans smoke tobacco, were industrious and particularly honourable men of business.

Dr. HAWORTH instanced Kaffir beer as an intoxicant (and frequent cause of crime) which was of purely indigenous origin entirely independent of any European influence.

A. A.

ARCHIVOS DEL INSTITUTO NACIONAL DE HIGIENE DE ALFONSO XIII. 1924. Oct. Vol. 3. No. 3. pp. 211-221.—**Notas Parasitológicas.** [LUENGO (E.), AZNAR (P.), DE BUEN (Sadí).] [13 refs.]

In this section of the "Archivos" brief references and remarks are made on matters which are not yet deemed of sufficient importance to warrant publication in extended form. Nine such are dealt with in the present issue, but only the following need be mentioned here :—

(1) *Blood changes following administration of "Bayer 205."*—The author finds a reduction in the mononucleosis as compared with that present before treatment, and a slight shift to the left of the Arneth count. In an adjoined table he presents other details, notably in two instances an increase in erythrocytes ; to over 7½ million per cmm. in one patient, and nearly 8½ million in the other. But, he states," these may be due to errors in technique."

(2) *The action of the serum of a patient treated with "Bayer 205" in preventing trypanosome infection of rats.*—Two rats only were used, and it was concluded that the serum is trypanocidal and prevents experimental infection, and that this action is not due to persistence of the drug as such in the serum, but to immune substances resulting from destruction of the parasites.

(3) *The Trypanocidal action* in vitro *of the serum of a patient treated with "Bayer 205."*—As a result of six experiments with guineapigs the serum was shown to possess trypanocidal properties, but not so powerfully as to bring about trypanolysis such as occurred *in vivo.*

(4) *Ankylostomiasis in Valencia.*—When carrying out an antimalarial campaign the author took the opportunity of examining faeces and found hookworm ova in an unstated number of the inhabitants.

(5) *The use of certain chemicals as larvicides.*—The chemical was in each case used in a strength of 1 in 1,000, and the following are the most important results : Ammonium or potassium nitrate killed mosquito larvae in 3 days, potassium nitrite in 48 hours, sodium nitrite in 3 hours ; neither the sulphate or chloride of ammonium, sodium hypo-sulphite, or hydrochloric acid had any detrimental effect. The author conjectures from these findings that Anopheles prefer clean water because putrefaction in foul waters, by formation of nitrate and nitrite, would be inimical to the larvae.

(6) *The geographical distribution of relapsing fever.*—Investigations have revealed the fact that in Spain there is a considerable area in which relapsing fever is endemic. In the Province of Cáceres 15 cases were seen, and 3 each in Toledo, Badajoz and Huelva.

H. Harold Scott.

de Mello (Froilano), Costa (Antonio Rodrigues), Paes (Santana) & Rebello (Frederico). **Impressions d'une visite médicale à Chibia.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 401–408. With 1 plate.

Chibia (lat. 15° 14′ S., long. 13° 14′ E.), in the south-western corner of Angola, lies nearly 5,000 feet above sea-level, in the broad vale of the Tchichimpura, in a region of hills and very fertile valleys. It has a regular rainfall, and the winter minimum temperature often falls several degrees below freezing point. The town is surrounded by all the elements of prosperity and might be a health resort for Europeans, and yet is a wretched discomfortable place with a population of only 1,090, of which 300 are negroes. Malaria is prevalent from March to May, and 10 per cent. of the population is infected with *Schistosoma haematobium* ; this is due to the fact that the Tchichimpura here is sluggish and in places marshy, forming ample breeding places for Anopheles and pond-snails (Bullinus and Planorbis). Dysentery, smallpox, and chickenpox are common, and in the cold weather pulmonary diseases are frequent, especially among the negroes. The intestinal parasites observed are ascaris, oxyuris, trichocephalus, and bothriocephalus. Though the place now is so unhealthy it could be made healthy at no great cost.

A. A.

Hertslet (Lewis E.). **The Medical Care of South African Natives on the Gold Mines of the Witwatersrand.**—*Jl. Indust. Hyg.* 1924. Nov. Vol. 6. No. 7. pp. 291–305. With 4 figs.

Here we have a first-hand account of the medical care of the natives at work on the Witwatersrand gold mines (*cf.* Brumpt & Joyeux, this *Bulletin*, Vol. 21, p. 388). The strip of the high veldt concerned is 70 miles long and 1 or 2 wide, lies at 6,000 ft. altitude and has a climate which is " one of the best in the world." Here, in 40 mines, are distributed some 184,000 natives who remain, as a rule, less than a year. Forty-five per cent. come from sub-tropical Portuguese East Africa, 30 per cent. from the Cape Province and the remainder are Basutos, Swazis, Bechuanas or Zulus, the great majority, when at home, living " in a condition of semi-barbarism." The average age is 20–30. Besides their wage they get a complete food ration, living and sleeping quarters, and free medical attendance. The author describes the medical examination of recruits, periodic weighing, the housing, dietary, diseases, mortality rates, hospitals, first-aid work, medical staff, research and experimental work, and welfare organization.

As to the examination of recruits, the instructions sent to the country doctors in the Union indicate, among other things, as a cause of rejection, valvular heart lesions, evidence of recent wasting, scurvy, extensive pyorrhea, venereal disease, tuberculous glands. Natives who come of their own motion or from Mozambique are examined by the medical officer at the mine. Every boy is weighed on arrival and again every month and the weight recorded on a card ; this system was introduced for the early discovery of silicosis or tuberculosis of the lungs, and, as all short weights are detained for medical examination, the labour force is continually under the control of the medical department.

The minimum ration, supplied ready for consumption [no details of cooking], is as follows :—

" *Mealie-meal,* or ground maize (Indian corn).—24 oz. ; 2,568 calories. This forms the staple diet of the bulk of South African tribes. It is used in two forms :—

" (*a*) Thick porridge, cooked by steam and issued in thick, hot slabs ;

" (*b*) Mahewu—a drink formed from the meal mixed with flour, made sharp in taste by a lactic acid fermentation.

" *Bread.*—6 oz. ; 441 calories. This is made from wholemeal flour and mealie-meal.

" *Beans or Peas.*—1·5 oz. ; 145 calories. These are put into the soup.

" *Germinated Beans or Peas.*—1·5 oz. ; 145 calories. These are kept in a warm, damp, dark place until sprouting begins. They are then mixed with the soup, and are valuable in the prevention of scurvy.

" *Meat.*—8·5 oz. ; 615 calories. Part of this is made into soup ; part is issued raw, and the boys are allowed to roast it at the fires in their rooms.

" *Peanuts* (ground or monkey nuts).—2 oz. ; 241 calories. These contain a large proportion of vegetable oil and are eaten raw.

" *Sugar.*—1 oz. ; 116 calories Part of this is used with the cocoa ration.

" *Fresh vegetables.*—5 oz. ; 80 calories. Of these, carrots and turnips are issued and eaten raw.

" *Salt.*—0·5 oz.

" *Cocoa.*—0·25 oz. ; 34 calories.

" *Kaffir-beer* made from amabele or kaffir-corn.—6 oz. This is usually issued three times a week."

The table gives the new admissions for disease in 1912 and 1923 of over 66,000 natives.

Disease.	1912.	1923.	*Variation.*
Pneumonia	4,432	1,081	—3,351
Silicosis	63	56	— 7
Tuberculosis of the lungs	675	302	— 373
Bronchitis	1,828	903	— 925
Cerebrospinal meningitis	72	187	+ 115
Enteric fever	242	164	— 78
Dysentery and other diarrheal diseases	1,127	491	— 636
Scurvy	618	138	— 480
Influenza	2,704	2,737	+ 33
Septicemia and cellulitis...	35	7	— 28
Heart disease	82	67	— 15
Liver disease	37	14	— 23
Venereal disease	133	376	+ 243
Rheumatism, acute and chronic ...	1,633	540	—1,093
All diseases	28,058	18,764	—9,294
All diseases, monthly average	2,338	1,564	— 774
Percentage of shifts lost through sickness	1·826	0·710	—1·126

" These totals are only for ten mines chosen for variety of position and conditions, and are a fair indication of the whole situation."

Decreases are shown in all cases but cerebrospinal meningitis, influenza, and venereal disease [the latter figures are small and suggest that many cases are unreported or that the figures do not include dispensary patients]. More than half the hospital beds are filled with accident cases. A comparison of the mortality rates for 1913 and 1923 show a drop for every disease except meningitis and heart disease (increases) and malaria (no change). The death rate from disease in 1923 was 11·86 per mille. The pneumonia rate in 1913 was 7·52 and in 1923 2·98 (0·33 of which is broncho-pneumonia).

The author writes :—

"Since the year 1918 the anti-pneumococcal vaccine devised by Sir F. Spencer Lister of the South African Institute of Medical Research has been administered as a prophylactic measure to all natives on every mine as soon as they have been passed by the medical officer as fit for work. The vaccine contains identified representatives of eight immunologically distinct groups of the pneumococcus. The usual practice is to give three inoculations, at intervals of from five to ten days, each dose containing eight billions of pneumococci. Over three million inoculations have been administered."

A. G. B.

TRANSVAAL MINES. **The Organisation of Native First Aid in Transvaal Mines. Report of Joint Committee. Issued by the Chamber of Mines.** 1924. Oct. 14 pp.

At a meeting of the Transvaal Mine Medical Officers' Association in June, 1923, it was resolved, after discussion of a paper on the organization of native first aid work, to appoint a committee to consider and to formulate suggestions on that subject, and we have here the Committee's report.

A. A.

KADANER (M.). **La pathologie des indigènes de la région de Lokandu.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 149–155.

Lokandu, where the author has spent two years, is on the Upper Congo at about 3° S. He gives his impressions of the diseases seen. In the examination of some 20,000 natives, macular *leprosy* has been recognized in 4–5 per cent. ; the native name is "bukoma." Nodular leprosy at first appeared to be rare but when the doctor had inspired confidence in the native mind victims appeared from semi-isolation in considerable numbers. The number thus affected reaches 0·5–1 per cent. Some success in treatment has been obtained by injections of atoxyl and tartar emetic (0·5 gm. atoxyl, 0·1 gm. emetic every 7 or 14 days).

Yaws is universal : injections of 914 have been used with striking success. *Syphilis* also is widespread along the river, rare in the interior. *Sleeping sickness* is found along the river between Kindu and Pontierville. In a stretch of 12 miles 75 cases were detected ; the natives come readily for treatment. *Smallpox* is rare owing to vaccination ; varicella epidemics are frequent and shingles usually appears at the same time. *Amoebic dysentery* is fairly common, 40 cases treated ; liver abscess is very rare. *Bilharzial dysentery* occurs less frequently ; bacillary dysentery is believed to occur. Statistics of *helminth* infection are given, but the number of examinees was small ; ascaris was by far the most common worm. The splenic index of *malaria* in children is 60 per cent. *Phagedenic ulcer* is widespread. *Goitre* is common in the women and children of certain villages. Of *tuberculosis* no case has been diagnosed with certainty. The tuberculin reaction was positive in 15 per cent. of troops in the camp (800 examined). Following an epidemic of pneumonia was an epidemic of *mumps*. A few *malignant tumours* have been met with.

A. G. B.

LENZ (Wilhelm). **Aerztliche Erfahrungen beim Bahnbau in Deutsch-Ostafrika 1909–1914** [Medical Experiences on Railway Construction in East Africa].—*Deut. Med. Woch.* 1924. Oct. 10. Vol. 50. No. 41. pp. 1417–1418.

Experiences of a P.M.O. during the construction of the railway from Dar-es-Salam to Kigoma and Tanganyika in 1909–14. About 400 Europeans and 15,000 natives were employed on the work, and 3 European medical officers. The labour was spaced at intervals of about 100 kilometres and also at points where extra heavy work was anticipated ; and as work progressed it moved on at the rate of about a kilometre a day, only a few large centres remaining fixed. The accommodation for the sick included a well-built hospital of 20 beds for Europeans, a central hospital of about 100 beds in wooden pavilions for natives, and wattle-and-dab dispensaries at intervals of about 30 kilometres for natives. At the European hospital, besides arrangements for microscope work there was a central medical store.

A. A.

FULLER (Claude). **A Visit to Northern Zululand.**—*S. African Jl. Nat. History.* Pretoria. 1924. Mar. Vol. 4. No. 4. pp. 269–276. With 1 plate.

The visit was made in September-October to a tract watered by the Mkuzi river and rendered extremely malarious at certain seasons by the swamps formed by the flooded stream. At this time, however, the land was in the hard grip of a nine-months' drought, but although the Anopheles were thus deprived of breeding-grounds they were found in large numbers sheltering in the dry reed beds. In almost every kraal *Ornithodorus moubata* was in evidence : this tick is said by the natives to retain life in kraals that have been abandoned for five years, and its bite is said to cause fever and syphilis-like sores. Itch is very prevalent, especially among young people, and particularly females ; apparently it subsides spontaneously in the course of two years and leaves a legacy of immunity. Jiggers are plentiful. The author could not discover any ground for the popular belief that dipping-tanks are inhibitory to mosquitoes.

A. A.

LEFÈVRE (R.). **Note sur les affections intestinales au Soudan Français (Cercle de Mopti).**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 944–945.

Contrary to accepted opinion, intestinal complaints are common in the French Soudan. Among the white population of the Mopti circle [Upper Niger] the author observed 15 cases of amoebic dysentery in a year, and at the dispensary *Entamoëba histolytica* was found in the stools of 127 patients examined. Enteric fever occurs among whites, and the author has diagnosed two cases among natives as enteric abscess, probably typhoid, although no laboratory confirmation was feasible.

A. A.

LEVADITI (C.) & NICOLAU (S.). **Le Neurovaccin.**—*Bull. Médical.* 1924. No. 53. 21 pp. With 6 plates and 4 figs. [10 refs.]

The natural affinities of neurovaccine have been referred to in this *Bulletin* (Vol. 19, p. 618, and Vol. 20, pp. 680 and 847), and its practical utilities also (Vol. 20, p. 847, and Vol. 22, p. 155). In the present paper these practical applications are the subject of controversy. The authors admit that the results obtained with neurovaccine still require to be studied in comparison with those obtained by ordinary Jennerian vaccination, but they insist on the ideal " microbian sterility " of neurovaccine and its facility of manufacture, and they also state that the rather violent local reactions sometimes caused by neurovaccine do not occur in the course of successive passages from skin to skin. This paper includes some excellent photogravure illustrations of neurovaccine pustules.

A. A.

DE FARIA E MAIA (Carlos Roma Machado). **Rapide mémoire sur les contrées de l'Afrique Portugaise où doit se fixer la race blanche spécialement la nôtre à la Province de Angola.**—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento). 1923. Aug. No. 4. pp. 167–178.

The author, a colonel of engineers, with an extensive knowledge of the Colony, gives an account of the tablelands which he thinks well suited for colonization by the white race, as well as the strip of coast between the 12th and 17th degrees of latitude. Here, *e.g.*, at Mossamedes, and in the interior are places where four generations of Portuguese have been born and bred.

A. G. B.

LHUERRE (H.). **Sur l'emploi abusif de la quinine dans le traitement des pyrexies.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 941–944.

The author gives the history of several patients with fever in Senegal submitted to prolonged treatment with quinine for conditions not dependent on plasmodial infection, *e.g.*, hepatic insufficiency, urethral stricture, syphilis. He attributes the large doses of quinine now given to the practice in Macedonia in the war, when the subjects were healthy and could stand toxic amounts, whereas many persons in the tropics cannot ; he suggests that since quinine paralyses the white corpuscles it may hinder their mobilization when an infection other than malaria is in question, so that large doses of quinine can in a sense cause fever. Finally he draws attention to the truth that in malaria it is the patient and not the parasite that has to be treated.

A. G. B.

COOKE (Francis H.). **Note on a Case illustrating the Importance of Microscopic Examination of the Urine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. p. 219.

" An African male adult, aged 22 years, consulted me complaining of the sensation of a worm passing up and down his urethra before micturition. There was no history or symptom of gonorrhoea, and no signs of blood in the urine, which was voided naturally and at regular intervals.

" A specimen of urine was passed in my presence, into a clean urine glass, was centrifuged, and under the microscope numerous scolices of *Taenia echinococcus* were found."

A. G. B.

BURKITT (R. W.). **The Modern Treatment of Fevers, with Suggestions therefrom as to the Treatment of Animals. Part I. Human Fevers.**— *Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 224–231.

A plea for the vigorous treatment of fevers from any cause by cold water, outside and in. The temperature is kept down if possible to 100°. The naked patient lies on a mackintosh sheet in a current of air and is kept continually wet till his temperature falls. His urine is never allowed to be acid ; bicarbonate of soda in plenty of water is given till the urine ceases to turn blue litmus red. A full-blooded person should be bled a pint or so. The patient is encouraged to drink " enormous lots of cold water." No food is given but sugar till he is hungry. The bowels are kept open and the mouth clean. By this method, given here in barest outline, the author claims to have treated 275 cases of pneumonia, before the 4th day, with only one death.

A. G. B.

TAOKA (K.). **Serological Studies of Experimental Protozoan Disease.**— *Japan Med. World.* 1924. May 15. Vol. 4. No. 5. pp. 111–115. With 1 chart in text.

A syphilitic serum contains a specific substance giving a specific complement fixation or precipitin reaction demonstrated respectively by Wassermann and Sachs-Georgi tests. The properties, and mechanism of reaction, of this substance have been made clear since its isolation in comparatively pure condition (TAOKA ; *Kitasato Archives*).

How this reacting substance is produced is not known. The author's experiments, here detailed, were directed to determine its origin. They cannot be summarized ; only an indication of the scope of the work and the author's conclusions can be given.

A study—chemical and biological—of the sera of—A. Rabbits infected with 1. *Trypanosoma gambiense.* 2. Rat-bite fever spirochaetes. B. Monkeys infected with rat-bite fever spirochaetes, and C. A man infected with rat-bite fever spirochaetes, revealed that after an incubation period specific substances are formed in the sera, in close relation to the courses and living phenomena of the infecting agents. In the trypanosome and rat-bite fever infections there is formed a substance reacting to the Wassermann and Sachs-Georgi tests, which resembles, and is probably identical with, the similarly reacting substance present in syphilitic sera : and besides this substance, there is formed as well, *in the rat-bite fever infections,* another substance—a haemolysin with anti-sheep haemolytic action. These two substances were separated and studied apart. In its manner of reaction this haemolysin resembles a heterophile immune body.

The fact that on infecting rabbits with trypanosomes and spirochaetes, different substances respectively are formed in the rabbits, indicates that it is the infecting agent which directly effects the production of these substances, rather than the host's body.

In the rat-bite fever infections, since the rabbit's organs are non-heterophile, the production of a body resembling heterophile antibody indicates that the spirochaete is the cause of its formation.

H. M. Hanschell.

POPOFF (P.). **Das Tropeninstitut und die tropischen Krankheiten Armeniens.** [The Tropical Institute and the Tropical Diseases of Armenia.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Oct. Vol. 28. No. 10. pp. 453–458.

Forty per cent. of Armenia lies 6,000 feet above sea level, but there are several mountain streams and rivers from which the cultivated land is irrigated. In the lower-lying parts malaria is widespread. In the bodies of ten persons dead of another disease malarial changes were found in all, in the bonemarrow, spleen and brain. The author was entrusted with the foundation of a Tropical Institute, primarily for the control of malaria. It has protozoological, helminthological and clinical divisions, under their several leaders, the Director being Dr. KARAPETJANZ. Four flying sections are available for malarial campaigns. Malarial parasites are found in the following proportions [number of examinations not stated]: *falciparum* 59·5 per cent., *vivax* 29·5, *malariae* 9 per cent. (June–August, 1923). The splenic index is said to average 5·7 per cent. *Anopheles plumbeus* Halliday has recently been discovered, a new record for Russia. In the Aras valley *A. pseudopictus, A. maculipennis* and *A. bifurcatus* were found: in the hills is another, undetermined, species. Undulant fever occurs; the people share their houses with donkeys, cattle, sheep and goats, and live largely on milk products. Twenty-two cases of pellagra, a very fatal disease, were seen and a case each of hill diarrhoea, sprue and blackwater fever. Amoebic dysentery is common. In the examination of 120 stools for helminths were found:—

A. lumbricoides	100 per cent.
Tr. trichiura	87 per cent.
O. vermicularis	20 per cent.
T. saginata	2 per cent.
Bothriocephalus latus ...	one case.

Echinococcus is fairly frequent in man and was found in Eriwan in 70 per cent. of dogs *Fasciola hepatica* has been identified twice in human livers. Of leprosy there are about 100 cases, now under treatment. Pappataci fever is common; dengue has not been observed. Kala azar has not been seen but is known to occur; similarly, dermal leishmaniasis is reported absent, but occurs in dogs.

A. G. B.

WORK (Hubert). **The Indian Medical Service.**—*Milit. Surgeon.* 1924. Oct. Vol. 55. No. 4. pp. 425–428.

The service here referred to is the medical service of the North American Indian Reservations, and the subject of the paper is not so much the nature and conditions of the service as the diseases it has to deal with. The writer states that there are no diseases peculiar to the American-Indian race, but that, by reason of the conditions under which they live, their insanitary housing and their faulty diet, they suffer in a peculiar degree from tuberculosis and trachoma, and—in the case of children—from severe and often fatal gastro-intestinal complaints. Venereal diseases are rare among the full-bloods who keep to their own traditionary customs.

A. A.

BAIS (W. J.) & VERHOEF (A. W.). **On the Biochemical Index of Various Races in the East Indian Archipelago.**—*Jl. of Immunology.* 1924. Sept. Vol. 9. No. 5. pp. 383–386. [10 refs.]

The writers, working on the east coast of Sumatra, have tested the blood of 1,346 imported Javanese coolies, 546 native Sumatrans (mostly of the Batak race), school children over 10 years and out-patients, and 592 imported Chinese coolies, and find their grouping, by Jansky numbers, and corresponding biochemical race indices, to be as follows, stated in percentages :—

	I.	II.	III.	IV.	Index.
	O	A	B	AB	$\frac{A+AB}{B+AB}$
Javan	39·9	25·7	29·0	5·4	0·9
Sumatran ...	43·7	23·0	29·0	6·7	0·82
Chinese	40·2	25·0	27·6	6·9	0·92

These results, they consider, admit the conclusion that the biochemical race index increases from British India (race index 0·56 according to the HIRSCHFELDS) eastwards and south-eastwards, and support the HIRSCHFELDS' assumption that the agglutinable element B originated in Central Asia.

They describe their methods of investigation, and they also have some interesting speculations on possible phyletic significations of the agglutinable element A.

A. A.

GARCIA DE QUEVEDO (Luis). **Influencias del clima, de la mala alimentaçion y de las enfermedades tropicales en el caracter del puertorriqueño.**—*Bull. Porto Rico Med. Assoc.* 1924. Dec. Vol. 18. No. 147. pp. 19–28.

This is an address to the Legislature and medical profession of Porto Rico. The author states that the Porto Rican of the present day is a physical wreck, that 85 per cent. of the children suffer from dental defects, hypertrophied tonsils and general under-development. These conditions are ascribed to the bad climate, high temperature and humidity, to anaemia due in part only to ankylostomiasis, in part to intestinal toxaemias of various kinds, to malaria, syphilis, filariasis and dental caries. Finally, the food of the Porto Rican is all wrong ; the elements are, if not deficient in quantity, badly balanced. In short, the author appears to regard Porto Rico as anything but a White Man's country and he calls upon the elected members and the medical profession to rouse themselves and do something. [See also HEGNER (this *Bulletin*, Vol. 20, p. 751), who attributes the prevalent ill-health to over-population and low wages.]

H. Harold Scott.

REIS (Fidelis), FRAGA (Clementino) & BARRETO (Fabio). **O problema da immigração japoneza para o Brasil.**—*Rev. Med.-Cirurg. do Brasil.* 1924. Dec. Vol. 32. No. 12. pp. 601–607.

The opinions of three eminent persons in Brazil relative to the immigration of the Japanese were asked. They are practically unanimous in saying that, to avoid racial and political disturbances, the number allowed should be restricted to 5 per cent. of the present number, roughly estimated as 40,000. Other reasons given are that the Japanese do not stand well the local conditions of labour and that they are believed to be highly susceptible to tuberculosis.

H. Harold Scott.

SIKORA (H.). **"Der gegenwärtige Stand der Rickettsia-Forschung." Bemerkungen zu der gleichnamigen Arbeit von Weigl in Jg. 3, Nr. 35, S. 1590 u. Nr. 36, S. 1636 dieser Wochenschrift.**—*Klin. Woch.* 1924. Oct. 28. Vol. 3. No. 44. pp. 2008–2009.

WEIGL, having criticized the "not entirely unobjectionable technique" and "something obscure description" of the author's work on the distinction between the intracellular Rickettsiae of the louse and the Rickettsiae found free in all parts of that insect, the author deems it necessary to give a review of that work and its technique. The only obscure point that the author himself acknowledges is whether *R. pediculi* and *R. wohlhynica* are distinct species, or whether the latter is a variety of the former which by some unknown influence becomes pathogenic to man. He himself thinks that they are two species, the distinction between which may hereafter be elicited by culture experiments.

A. A.

i. VAN NITSEN (R.). **De la fréquence de la pneumonie chez le noir du Katanga.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. pp. 227–228.

ii. LANGERON (Jean). **Etude sur la pneumonie. II. Etude sur la sérothérapie de la pneumonie. Valeur thérapeutique des sérums des convalescents.**—*Ibid.* pp. 229–233.

iii. SPEDENER. **Le traitement des pneumonies des noirs par transfusion de sang des convalescents.**—*Ibid.* pp. 234–238. [6 refs.]

iv. VAN NITSEN (R.). **La pneumonie chez le noir. Essais de traitement.**—*Ibid.* pp. 239–242.

v. GERMOND. **Statistique des cas de pneumonie traités par transfusion de sang des convalescents.**—*Ibid.* p. 243.

i. Statistics are given from the Native Hospital, Panda. In a period of two years there were 892 admissions for pneumonia; cases complicating other diseases are excluded. Apart from 14 brought in dead or dying the mortality was 21·6 per cent. In the same period 4,901 new cases were admitted, so that pneumonia represents 16·15 per cent. of admissions. If the average stay of a pneumonia patient in hospital be put at 40 days, these illnesses accounted for 35,680 days or 1,486 days a month. Again, in this period there were 269 deaths, so that pneumonia caused 77·3 per cent. of the total deaths; 8 out of every 10 deaths owned this cause.

ii. The serum of hyperimmunized animals has been employed in the treatment of pneumonia in man, and where it is effective its action appears to be specific; the difficulty, however, of determining what serum will be active in a given case restricts its use. In a localized epidemic the pneumococci will belong to the same type or to a small number of types, so that the serum of a convalescent is likely to contain the desired therapeutic substance.

The author, fearing the possible presence of pneumococci in the serum and blood incompatibilities, gave it at first subcutaneously, but this not availing, he used intravenous inoculation with a heated serum. In case there is more than one type, it is his practice to employ three serums, 30 cc. of each, *i.e.*, about 100 cc. If no improvement follows, the next injection consists of a mixture of three other type serums, but this change is seldom necessary. The author removes from the donor 500 cc. of blood, and finds he can, without retarding convalescence, take 500 more in 5 to 8 days' time.

As a rule, 150 cc. of serum is used for injection, so each convalescent provides serum for two treatments. He has himself injected 45 natives and has never observed any untoward symptom. Improvement sets in 2–3 hours later and is very decided after 10–16 hours. The later the intervention and the graver the symptoms the larger should be the first injection of serum. The first injection is of 100 cc. in mild cases, at least 150 in others: 24 hours later an injection of 50 cc. is given if the improvement is decided, 100 or 150 in the contrary case. If 48 hours pass without a marked return of symptoms the treatment is suspended. The effect can be gauged by the figures: 55 cases were treated by the subcutaneous way with 14 deaths, 25·45 per cent.; 84 cases were treated intravenously with 8 deaths, 9·5 per cent. Serotherapy does not prevent relapses and secondary localizations. Broncho-pneumonia, however, is often favourably influenced.

iii. The method of treatment described has been applied in 238 cases of pneumonia at the Hôpital de l'Etoile; 50 cc. of blood, with 5 per cent. of citrate of soda, was injected daily into a vein, by means of two glass syringes, each containing 25 cc., till the temperature fell. Symptoms of shock were noted in two instances. The blood was taken from vigorous convalescents 3 or 4 days after defervescence. The mortality remains high, and in the 238 cases was 13·45 per cent. However, in 16 instances of death the pneumonia was complicated with dysentery, bilharziasis or meningitis, and if these be omitted the mortality figure becomes 7·7 per cent. In the last two months he has combined blood injections with intravenous vaccination. In each instance 500 million pneumococci were introduced into a vein on two successive mornings and in the afternoon the convalescent blood; on the third day a milliard of microbes was administered. Forty-four cases have been treated by this " vaccino-haemotherapy " with four deaths.

iv. As illustrating one of the difficulties in appraising a remedy in pneumonia the author compares three epidemics, one very fatal, another less grave and the third mild. His figures concern 1,547 cases observed over a period of three years. Remedial measures are classed in three groups—Divers treatments; colloids; and transfusion of convalescent blood. In the first class, which included vaccinotherapy, no treatment appeared to have much value; 744 cases were treated with 165 deaths, a mortality of 22·17 per cent. Colloids, given intravenously, yielded somewhat better results, 581 cases with 114 deaths, *i.e.*, 19·6 per cent. But the transfusion of convalescent blood, as recommended by SPEDENER, gave still better figures. Of 223 thus treated 34 died, or 15·2 per cent. Eliminating cases where dysentery or bilharziasis were complications, the mortality was 12·1 per cent. The figures show that as far as Congolese and Rhodesians were concerned race had no influence on the result. He thinks that still better results may be obtained and doubts whether repeated injections are superior to a single one. The method, the author admits, is empirical. It takes no account of the different types of pneumococci nor of the fact that in the pneumonic negro pneumococci are frequent in the blood and might create a new focus of infection. However, it gives the best results and must therefore be seriously considered.

v. One hundred and two cases were treated with 15 deaths. Figures of race and of concomitant ankylostomiasis and bilharziasis are given.

A. G. B.

Kadaner (M.). **Quelques observations sur la pneumonie des noirs.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 157–162.

In 1922–23 the author had in the military hospital at Lokandu more than 300 cases of pneumonia. Lokandu is a centre for military instruction, and recruits of several races come in from the districts in driblets during the year. In 1922 the contingent exceeded 1,200 men. Such a recruit, away from home under new conditions of diet and environment, falls an easy prey to disease, and especially pneumonia, which was the cause of 68 per cent. of the deaths in this camp. A table shows that pneumonia increased in prevalence as new contingents came in, a large draft being marked two months later by an increase of incidence and severity. It is not so much the numbers which augment the pneumonia incidence as the association of non-immunes of different tribes. Another table shows that 25, 15 and 12 per cent. of the cases occured in the 1st, 2nd and 3rd months after arrival. Tribes unaccustomed to leave their own country were much more susceptible than others. The women and children also suffered, but to a less extent, and this is attributed to the fact that the women of a tribe kept together and only gradually consorted with those of other tribes, whilst the men were thrown together at once. In short, the author's experience corresponded with that of Pearson and Mouchet.* The author thinks that for any camp which receives from time to time fresh non-immune labourers there should be a "camp de préparation" in order that the new may be brought only gradually in contact with the old natives. The paper closes with notes on the symptoms, treatment and complications. Sometimes for the first two or three days of pneumonia, there is no symptom but fever.

A. G. B.

Cunningham (J.), Cruickshank (J. A.) & Ramakrishnan (S.). **Note on the Types of Pneumococci found in Cases of Pneumonia in Madras, Southern India.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 479–480. [2 refs.]

Lobar pneumonia is not a common disease in Madras; the authors have collected strains from all cases brought to their notice in two years. Of the 40 strains, 11 could not be classed as true pneumococci.

Type I.	Inulin+Bile soluble.			Total.	Inulin+ Bile non-soluble.	Total.
	Type II.	Type III.	Type IV.			
18	3	2	6	29	11	40
per cent	per cent.	per cent.	per cent.	per cent.	per cent.	
62·06	10·7	7·2	21·4	72·5	28·2	...

The proportion of Type I strains is much higher than that found by Malone in the North of India [28 per cent.; see this *Bulletin*, Vol. 21, p. 464].

A. G. B.

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* "The Practical Hygiene of Native Compounds in Tropical Africa." 1923. London: Baillière, Tindall & Cox.

Park (William H.). **Use of Vaccines and Pneumonia Antibody in the Treatment and Prevention of Pneumonia and the Use of Convalescent Serum in the Prevention of Measles.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 834–849. [United Fruit Company, Boston, Mass.]

This paper deals with lobar pneumonia. There are known to be three dominant types of pneumococci, I, II, and III, which together account for 60 to 80 per cent. of cases of lobar pneumonia. Type IV includes a number of distinct types. The effect of a highly potent serum of one type upon another type of pneumococcus is slight. In South Africa, Lister has discovered another dominant type, so that investigation in each locality should be made before pneumococcus vaccine or serum is used. In the use of the serum, since there is not time for a test, it is desirable that it be polyvalent as well as potent, but with the crude serum this was impossible. Favourable results have been obtained in Type I cases treated with potent serum, mortalities of 7·5 and 9 per cent. against a natural mortality put at 20 per cent., and it is noticed that the patients change for the better. But the monovalency of the serum is a serious drawback; all patients are subjected to the annoyance of repeated large serum injections and probably to later serum-sickness, while only one-fourth can get benefit. Attempts have therefore been made to discover some practical method of concentrating the antibodies and eliminating the useless substances.

"In May of 1924, Felton, who had worked under Rosenau, and was aided by a grant of money from the Influenza Commission of the Metropolitan Life Insurance Company, published a simple and efficient method for extracting the antibody from the serum. Felton discovered that when potent, freshly-drawn anti-pneumococcus serum was mixed with 10 to 20 times as much distilled water, a dense precipitate of globulin formed, which deposited at the bottom of the holding vessel. This precipitate, after further washing and antifying [sic], was brought again into solution. The final globulin preparation had about 10 times the potency of the original serum and a much smaller amount of proteins.

"Felton has successfully refined the antibody for each of the dominant types of pneumococci, but up to the present time only Type I antibody globulin has been used in the treatment of lobar pneumonia. The tests reported by Felton show that the antibody has the same effect, in combating pneumococcus infection in animals, as the original serum. Felton believes that in addition to removing non-potent patients' other substances by his process, he also removes something which is antagonistic to the antibody, so that the number of units in the refined serum may actually appear to be greater than the number before refining."

A quantity of this serum has been distributed to New York hospitals, and the author describes some of the cases. Pneumococci promptly disappear from the blood and antibody can be demonstrated 24 hours after the injection. From these "it seems clear that the Felton antibody solution administered intravenously in doses of 6 to 10 cc. gives protective character to the blood for pneumococcus Type I." An account is given of the method of administration and of the reactions which follow. Of 19 pneumococcus Type I pneumonias receiving the serum, one only died, a mortality of 5·6 per cent., and clinical impression was favourable. The injections are given once or twice a day. By Felton's method the antibodies of several types may be combined into a potent polyvalent antibody solution. [The paper is ill-named, for measles is not mentioned in the text.]

A. G. B.

PARK (William H.). **Prophylactic Vaccination against Lobar Pneumonia.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 853–856. [United Fruit Company, Boston, Mass.]

By vaccination of small animals it has been clearly established that antibodies protecting from the same type of pneumococci are produced by inoculation of these organisms. Whether freshly prepared or long-stored or from vaccines made from freshly isolated or long-cultivated strains, they are equally effective. In man, only 50 to 80 per cent. of cases of lobar pneumonia are due to the three dominant types; the rest are outside the influence of the vaccine, for it is impracticable to include more than three types. Similarly, it is doubtful whether three injections—expense and patients' objections prohibit more—are sufficient. The author's investigations were made at the instance of the Influenza Commission of the Metropolitan Life Insurance Company. He gave to 1,536 employees three injections of 6,000,000,000 pneumococci of the three types together with two and one milliard of streptococci and influenza bacilli; there were 3,025 controls. In the five months following 11 lobar pneumonias developed among the controls and one among the vaccinated, 0·36 and 0·06 per cent. In the next three months no pneumonia occurred among the unvaccinated and 2 among the vaccinated. It is suggested that the inoculation protected many in the first period, and in the second the protection was on the wane. However, another test—on the inmates of an Asylum for the Insane, 2,000 experiments and 2,000 controls, the injections repeated every six months for three years—showed no appreciable effects from the vaccine. Here Type IV was found to the extent of about 40 per cent., and many of the pneumonias were terminal or broncho-pneumonia and therefore little influenced by vaccination. To this and the peculiar type of the population under experiment the non-success may be due. A. G. B.

i. MALONE (R. H.). **A Report on the Prophylactic Inoculation of Indian Troops in the Baluchistan District against Pneumonia.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 565–569.

ii. KING (H. H.). **An Analysis of Captain Malone's Results in Vaccination against Pneumonia.**—*Ibid.* pp. 571–577.

i. Pneumonia has for many years been a serious disease among Indian troops stationed on the North-West Frontier, so that it was decided to test the effect of prophylactic inoculation of pneumococcus vaccine. Previous work showed that the types most commonly found were I, II, and IV. In the winter of 1922–3 a trial was carefully planned and carried out in Baluchistan. Details are given of the method of collecting and recording the data. Half of each unit was to be inoculated, the remainder to serve as control. Actually 2,996 were inoculated and 5,227 not inoculated. The vaccine was prepared from two strains of pneumococcus, Types I and II, isolated from fatal cases in 1921, prepared from 72 hour cultures in trypsinized mutton broth plus glucose and blood; the strength was 5,000 millions per cc. Two doses of 1 cc. each were given subcutaneously at a week's interval in October and November 1922. The incidence of pneumonia in the inoculated and the uninoculated to March 31st, 1923, is given in a table and shows that "the pneumococcus vaccine prepared and employed in the manner described afforded no protection against pneumonia caused by all types of pneumococcus or by the specific types I and II."

ii. The author makes a careful statistical examination of MALONE's figures and relevant data and concludes that

> "(1) The vaccine used was without effect on the incidence and the total mortality of pneumonia.
>
> "(2) The distribution of types of pneumococcus in vaccinated and unvaccinated cases of respiratory disease in the same units was not significantly different.
>
> "(3) The distribution ot types in cases was different in followers and combatants, the former having a higher proportion of the three fixed types.
>
> "(4) The mortality of type I was greater than that of type IV.
>
> "(5) The last three conclusions are tentative because larger figures are required."

He notes that most workers now emphasize the necessity of using young (12-18 hours) unautolysed cultures in the preparation of vaccine.

A. G. B.

OLIVER (Thomas). **Influenzal Pneumonia in some of its Pathological Aspects.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 821–828. [3 refs.] [United Fruit Company, Boston, Mass.]

In the discussion which followed the reading of this paper Dr. Milton J. ROSENAU gave an account of his attempts to convey influenza to 99 healthy young volunteers. Old attenuated cultures of Pfeiffer's bacillus were placed upon their nostrils. Cultures freshly isolated from the lungs of fatal cases were transferred to their nostrils and throats. Material from nose and throat and sputum were placed on their lips and nostrils. Similar experiments were repeated with the volunteers on the spot to avoid damage to the virus by delay. Material from the nose and throat of the sick was given the volunteers to drink and was injected under their skins.

> "We took 20 of our volunteers and placed them in direct contact with 20 selected cases, or donors. These donors had been selected with all the care that clinical skill could make possible. We took cases as early in the disease as possible,—mild cases and severe cases—all with fever, with leucopenia, with cough and the other indications that we have of influenza. I shall follow only one case, and ask you to remember that the other 19 were doing just the same as this one :—
>
> "This volunteer is brought up to the bed beside the donor and placed on a little stool, both donor and volunteer co-operating. They shake hands and talk close together for five minutes. Then at a signal (ringing of a bell) these two persons (the donor and the volunteer) get as close together face to face as they can, and the patient breathes out quite hard while the volunteer receives this breath, breathing it in five times, and after that the donor coughs right into the face of the volunteer. After about ten minutes he then moves to the next selected patient, so that each volunteer comes in contact with each of the selected cases.
>
> "This being accomplished, we took the volunteers back to the island, watched their temperature, etc., and not one of them took sick in any way. We then thought that perhaps we were not getting the donors as early in the disease as might be desirable. . . . So we tried to get such cases."

All was in vain. Not a single case of infection was procured. Dr. ROSENAU does not wish anyone to infer that influenza is not spread by secretions from the mouth and nose, but "perhaps there are factors not understood."

Dr. **Deeks** drew attention to the treatment of septic conditions, and especially post-influenzal pneumonia, by mercurochrome. It is given in 1 per cent. solution, 1 cc. for every 10 lbs. of weight, by intravenous injection.

A. G. B.

Roy (J. N.). **Le Goundou.**—*Rev. Méd. et Hyg. Trop.* 1925. Mar.-Apr. Vol. 17. No. 2. pp. 33–63. With 1 text fig. [46 refs.]

In his prefatory remarks, Dr. Roy, Professeur agrégé at the University of Montreal, says: The time has arrived to rewrite the chapter of medicine dealing with goundou, and having made the round-trip of Africa taking special notice of this disease, the subject matter of the present article was communicated to the French Congress of Oto-rhino-laryngology in October, 1924, at Paris.

Some of the earlier cases which the author had the opportunity of seeing on the Ivory Coast probably coincided with the first cases of the long series observed and described by Botreau-Roussel in the interesting monograph recently reviewed in this *Bulletin* [*ante*, p. 421]. Roy at the time of writing was apparently aware that Botreau-Roussel had operated on a large number of cases, but it seems doubtful if he were conversant with the observations and findings contained in that monograph. Roy's observations, in comparison, lack much that those of Botreau-Roussel contain and his total of cases was only 34. He finds the disease commoner in males than females, a statement of little value when dealing with such small numbers. He accepts the congenital case described by Strachan, and is apparently satisfied that the goundou-like condition which has been described as occurring in monkeys has the same pathogeny. Historically he adds nothing new, and geographically he omits from the list of countries in which goundou occurs certain colonies such as Portuguese East Africa and Nyasaland. From two cases typical paranasal tumours were removed and examined, a full description being given of the pathological changes found. These tally with those given by Botreau-Roussel. Microscopical examination of material stained for spirochaetes was negative, but in a section stained with haematin-eosin and safranin three slightly oval, nearly circular bodies were seen coloured yellow by safranin. These had a diameter of 25–30μ and possessed a well-marked highly refractile limiting membrane. They are mentioned without insisting on their possible significance.

Roy's clinical findings are much the same as those of Botreau-Roussel: a generalized enlargement of lymphatic glands was common; an associated osteitis affecting other bones both long and short, but never the vertebrae, occurred in a proportion of cases; he, however, apparently never saw the palatal vault encroached on nor any of the extreme forms figured by Botreau-Roussel. The chief point, however, in the paper lies in the fact that Roy believes that the etiology of goundou is unknown, and while excluding syphilis and other diseases as possible etiological factors, he equally has no hesitation in asserting that the disease is not due to yaws. If, however, the histories of his cases are examined, the following points emerge: Of the total 34 cases (*a*) 24 had goundou, (*b*) 7 had goundou plus osteitis of other bones, (*c*) 3 had osteitis without goundou. All the cases under (*b*) and (*c*), 10 in all, had had yaws, and of the 24 under (*a*) 14 acknowledged having had that disease. Of the remaining 10 cases stated not to have had yaws, 3 individuals aged 23, 28 and 30 years stated that they "did not remember" whether they had had the disease; the other cases were aged 25, 23, 23, 22, 15, 12, 11 years respectively, and while denying yaws, may have been affected in early childhood and forgotten the fact, just as people in this country forget whether they have had measles. In those patients who had had yaws, the common sequence noted by BOTREAU-ROUSSEL, of yaws followed in a year or two by the appearance of goundou, was a common history. There is a very great deal of evidence therefore, on the author's own showing, in spite of his opinion to the contrary, that as BOUTREAU-ROUSSEL holds, goundou is a manifestation of yaws.

Roy assigns a good deal of importance, as evidence against the yaws theory, to the presumed congenital case described by STRACHAN. Of this West Indian negro child, aged three years when seen in 1894, that observer wrote: "These masses were congenital and had only grown with the child's growth and not apparently more rapidly than the bone of which they proved to be a portion." This statement obviously reflects what he was told by the mother, and in the absence of any other evidence that goundou is congenital is of very doubtful value. Roy again adduces as evidence against yaws being the cause of the disease the observation that goundou does not respond to treatment by iodides and salvarsan derivatives, and sides with BRUMPT, who, under the designation of "pseudo-goundou," would place those cases which have been found to respond to such treatment. This appears to be begging the question, and the true explanation is probably to be found in BOTREAU-ROUSSEL's observation that in an early stage, when the pathological process is active and bone formation has not gone far, treatment is effective, whereas in other cases in which the active stage has come to an end treatment will have no effect on what might be termed the bony scar. The author, while accepting the fact that there may be a generalized osteitis of the same nature as goundou, does not seem to realize that such cases resemble those described as due to yaws all over the tropics. He believes, too, that the paranasal type is much commoner than the generalized form, an opinion in support of which he offers little evidence.

This paper by Roy, coming after BOTREAU-ROUSSEL's monograph, appears to add little that is new to this interesting subject. It has been subjected to a critical review with the idea of stimulating observations elsewhere. What is perhaps most wanted is a careful study of the question among those inhabitants of the Ivory Coast, where yaws is endemic, and whence BOTREAU-ROUSSEL drew his cases. It would promise a most interesting field of investigation.

H. S. Stannus.

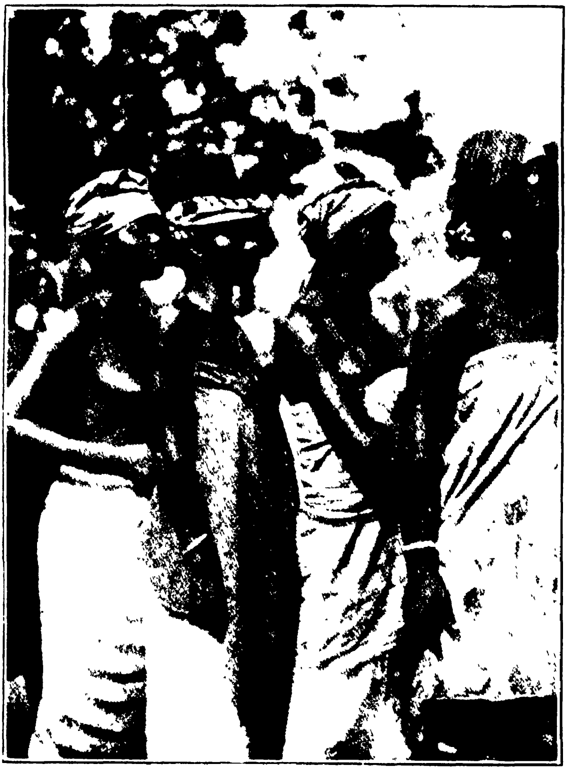
BOTREAU-ROUSSEL & CORNIL (L.). **Considérations anatomiques sur la structure des tumeurs paranasales du Goundou.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 863–868. With 2 figs.

A histological study of material obtained from eight cases of goundou occurring on the Ivory Coast, from which the authors deduce that these paranasal outgrowths are not truly tumour formations, but the result of an inflammatory hyperplastic osteitis showing changes in the bony trabecula and medulla comparable with those of a syphilitic osteitis. They believe that their findings support the view of a frambоesial origin. The report is full and illustrated by two figures showing the changes described.

H. S. Stannus.

Blacklock (D. B.). **Appendix X.—Report on an Investigation into the Prevalence of Goitre in the Protectorate of Sierra Leone.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* pp. 71–80. With 2 maps & 6 figs.

The author discusses past and present theories of the causation of goitre, especially the iodine deficiency theory, which presumes a natural lack of iodine in the food and water of certain places and the infective theory, which admits the deficiency of iodine, but supposes it to be produced by the intervention of faecal organisms which the subject has ingested. Goitre is prevalent in the mountainous Konno and Koinadugu districts of Sierra Leone, and the author's plan was



Group of young women at Kaiyima in Sierra Leone, all wives of one chief and all affected with goitre. There were seven of his wives affected, but two are out of the picture.

[Reproduced from *Sierra Leone Annual Medical and Sanitary Report,* 1923.]

to follow up a river, the Bagwe, and investigate the villages on its banks, with the object of testing the natural deficiency theory. Of 37 villages examined 22 had cases of goitre in a population of 2,465; in 1,532 males there were 161 cases, or 10 per cent., and in 933 females there were 222, or 23 per cent. The several percentages are set out in a table which shows that in one village (Kaiyima) more than half those examined were affected. The female preponderance is believed to be real, and this corresponds to the findings elsewhere. A table of the approximate age incidence shows that, whereas up to the age of 10 the sexes are equally attacked, the period 11-40 gives a much larger incidence in females, and in this connexion it is noted that the females come more intimately in contact with water than the males. The tribal incidence varied greatly: the Konnos had the highest percentage, males 13, females 45. Myxoedema was not observed, and cretins but rarely; such, however, might not survive among primitive people. Two cases of exophthalmic goitre were seen.

The disposition of the goitrous villages on the Bagwe was such that it is improbable that natural deficiency of iodine or of anything else will account for the disease; villages on the watershed were free; but the habits of the Konnos are calculated to produce an unusual amount of pollution of water by faecal organisms; not only is it " the invariable custom for people of both sexes to perform their natural functions in water," so that special portions of streams are set aside for that purpose, but streams selected are frequently sluggish and the latrines situated above the drinking places, as is illustrated by a sketch map. At the village called Kaiyima, where more than half those examined were goitrous, collateral evidence of faecal contamination of water was sought by examination for *A. lumbricoides* and *E. coli*; of 144 persons, 86 harboured that, and 102 this parasite, indicating a serious amount of infection via the mouth. The other tribes in this country use land latrines, so that the degree of pollution of water varies. The author notes that goitre impairs the subject's usefulness, and lessens resistance to fatigue. He concludes that:—

> " If iodine-deficiency is accepted as the cause of goitre, the facts here would be best explained on the theory that the deficiency is either an artificially produced one, or else one produced by natural agencies not understood which fail to come into operation at the greatest altitudes."

He suggests " a permanent sanitary demonstration " at some heavily infected village to show the natives the advantages of keeping the water supply free from pollution and of returning excreta to the land, and the introduction of iodine into the salt, which is all obtained from Freetown.

A. G. B.

DE ALMEIDA (M. do Nascimento). **Contribuição para o estudo da " Sassa " (bócio endémico) no planalto de Benguela.** [Endemic Goitre in the Elevated Plains of Benguela.]—*Revista Méd. de Angola.* (No. especial 1^e^ Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 95–103.

Goitre is found in circumscribed areas of the Districts of Benguela and Bié, in Luimbale, Bailundo and Andulo, at a height of 1,200 to 1,800 metres. One hilly district goes by the name of Omunda-ia-Sassa (" Goitre Mountain "), owing to the fact that practically all the natives of this region are affected. The cause of the disease and of its peculiar limitation is obscure. Thus, amongst a considerable number of villages in the neighbourhood of the Catholic Mission of Bailundo, whose inhabitants drink the water of the streams arising in the mountains, cases are few or absent, but several are seen amongst those who live further away, yet drink from the same water when the streams have united to form small rivers. Nevertheless, the idea is generally held that it is the water—the presence of some noxious substance, or the absence of some necessary constituent—which is responsible. Neither age nor sex exempts, cases being seen amongst men, women and children. Many of those living to old age have had the swelling since childhood. Even though the enlargement becomes very great it seems to affect their vitality little, if at all. Europeans are apparently never attacked, even though they drink the same waters, and in spite of the fact that some revert and live the life of the natives.

The missionaries treat the patients by administering potassium iodide internally and applying tincture of iodine externally, and claim that the swelling disappears if treatment is undertaken early. Short notes are given of 19 cases, their ages varying from 12 to 70 years, in whom the condition had existed for period of from 2 to nearly 50 years.

H. Harold Scott.

BUSSA-LAY (Enrico). **Il gozzo in Eritrea.**—*Policlinico.* Sez. Prat. 1925. May 25. Vol. 32. No. 21. pp. 735–741. With 9 text figs. [10 refs.]

Goitre in Eritrea is endemic, particularly in Asmara, Saladio and Seicchetti. The author has seen it at all ages, from childhood to old age, but the percentage is greater in adults and in women than in men. Details of his operative procedure are given, and a table of 16 cases. The paper contains some good illustrations of the condition as seen before and after operation. In the author's opinion medical treatment is not of much avail.

H. Harold Scott.

NINO (Flavio L.). **A propósito de la campaña profiláctica emprendida por el D.N. de H. contra el bocio y el cretinismo endémico en el país. Observaciones de un viajero a reg. bociógenas.**—*Semana Méd.* 1925. Jan. 8. Year 32. No. 2 (1617). pp. 91–100. With 7 figs., 1 map & 1 chart in text. [11 refs.]

The author travelled through parts of the Province of Tucumán, Argentina, to study the incidence of goitre and cretinism, which in several districts was very high. Taking all ages into consideration and various degrees from visible enlargement of the thyroid, including also those with signs of cretinism and mental deficiency, he found 62·3 per cent. to be affected, and among the young adults, 80 per cent. He gives notes of 10 cases showing that the leucocytic formula remains practically normal unless definite symptoms of cretinism are present when the polymorphonuclears are reduced, and the lymphocytes increased; in advanced cases and in imbeciles the normal proportions may be reversed. He found that animals, particularly dogs and goats, were also goitrous. As regards treatment, he formulates plans for asylum-colony segregation for advanced cases and local dispensaries for those in the earlier stages.

H. Harold Scott.

DAVIES (E. A.) & BELL (P.). **Intravenous Injections of Sodium Iodide in the Treatment of Goitre.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 163–165.

Cases of goitre in natives of the Chin Hills, Burma, received a course of intravenous injections of 5 to 7 grs. of sodium iodide with apparent benefit. The drug was given also by mouth and subcutaneously.

A. G. B.

PRUYS (H. S.). **Ondervoeding en schildklier.** [Subnutrition and Thyroid Gland.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 19–35. [2 refs.]

Basing his opinions upon those expressed by Ivo Geikie COBB in his work, "The Organs of Internal Secretion," the author ascribes a multitude of symptoms to disordered function of the thyroid gland. Psychic alterations of neurasthenic type, giddiness, hypersensitivity to cold, a chronic affection of the skin [of which no exact description is given], oedema, reduced amount of urine or anuria, discoloration of the hair, fragility of the nails, slackness of muscles and ligaments, are attributed to this cause.

During the years 1920–1923 Pruys met with many cases of subnutrition among the population of the hills round Wonosobo (Java). The high prices of food in these years did not interfere with the nutrition of the native farmer, but they did with that of the day labourer. This class, as well as the pauper, were chiefly concerned. The native pauper never suffers from a single disease; therefore several cases of oedema could be attributed to other causes (hookworm, nephritis, etc.), but the remarkably large group of unclassified dropsy cases urged the author to look for some special reason. He thinks that the general subnutrition caused secondary disorders of the thyroid function and provides proof for his opinion by the rapid beneficial influence of thyroid preparations (once or twice per day 50 mgm. of the dry substance) in these cases.

W. J. Bais.

PIGEON (E.) & LE BOURDELLES (A. C. B.). **A propos de la lymphogranulomatose inguinale subaiguë de Nicolas et Favre.**—*Arch. Méd. et Pharm. Milit.* 1924. Dec. Vol. 81. No. 6. pp. 776–783. [4 refs.]

The authors discuss the subject of climatic bubo, with particular reference to a memoir by the senior author and TANTON on about 200 cases observed by them in Algiers (*Arch. gen. de méd.*, No. 2, Feb., 1908), as a preliminary to an account of 6 recent cases in which once more a careful bacteriological examination was made [see also this *Bulletin*, Vol. 20, p. 432]. In none of these cases was there any concomitant lesion of the genitalia or any abrasion; in all, the histology was that of periadenitis and congestion of the glands, with points of suppuration. In three of the cases the tissues reserved for bacteriological investigation were not properly aseptic when received; in one of these a streptococcus was found in association with a diphtheria-like bacillus, in another putridity, in the third no organism of any kind. In the other three cases, in which the material examined was perfectly aseptic, no organism could be discovered in any of the nine different culture media used, nor could any effect be produced on a guineapig. Examination of fresh pus from glands and of variously stained pus was equally fruitless, and the authors therefore think that the true pathogenetic agent of the disease is still to be discovered. As regards treatment, the course recommended is early diagnosis and immediate excision (*l'opération précoce*).

A. A.

FRANCESCO (Virgillo). **Sopra alcuni casi di linfogranuloma inguinale subacuto.**—*Ann. di Med. Nav. e Colon.* 1925. Jan.-Feb. Year 31. Vol. 1. No. 1-2. pp. 1-16. With 2 figs [33 refs.]

Seven cases are described by the author as suffering from subacute lymphogranuloma, probably of sexual origin and identical with climatic bubo. The reason for the name is not very clear. In five of the cases there were either abrasions on the glans or prepuce, or a venereal ulcer, or sores on the legs to account for the glandular enlargement; the sixth had suffered previously from gonorrhoea. In five, also, pus was found on incising the swelling.

H. Harold Scott.

VIOLATO (Andrea). **Linfogranulomatosi inguinale benigna.**—*Ann. di Med. Nav. e Colon.* 1924. Nov.-Dec. Year 30. Vol. 2. No. 5-6. pp. 259-275. [20 refs.]

Here is recorded the case of a man of 34 years with unimpeachable history in whose left inguinal region there developed in the course of a fortnight a glandular swelling, 12 by 7 by 5 cm., the skin over it being reddish-violet in colour. At the end of a month, as no change had resulted from treatment, the author decided to extirpate it and found it to be made up of five or six small glands adherent to each other. On section they were seen to contain small pockets of pus, the cellular constituents of which, however, were mononuclears rather than polymorphonuclears. No organisms were seen and all attempts at culture proved negative. The author discusses the question as to the possibly tuberculous nature of these swellings, and holds that the organisms described by others have not been proved to be causative of the condition.

H. Harold Scott.

SINCLAIR (Charles G.) & MAXCY (Kenneth F.). **Mild Typhus (Brill's Disease) in the Lower Rio Grande Valley.**—*Public Health Rep.* 1925. Feb. 6. Vol. 40. No. 6. pp. 241-248. With 1 map. [4 refs.]

" Tabardillo " is known to have existed in the highlands of Mexico since the great epidemic of 1576, but has been limited to the plateau. It was shown a few years ago that the body louse, common in the highlands, is almost unknown among the low-country peoples, and this seemed to explain the restricted prevalence. The authors, in the summer of 1924, studied an outbreak of fever at and near Rio Grande City, Texas, which has an elevation of about 160 ft. Notes were made of 20 cases, 14 of which were in Mexicans. The symptoms correspond closely with BRILL's description. The onset is abrupt, with severe headache and fever which reaches its maximum in the first week, becomes remittent in the second, and returns to normal in about 14 days (7 to 25).

" Eruption appeared on the third to sixth day, usually first on the abdomen, chest, and upper arms, later spreading to the back and extremities, rarely to the face. In some cases a preliminary dusky mottling of the skin was noted, particularly in the interscapular region of the back. The spots appeared at first small and discrete, could not be felt, were apparently erythematous in character, dull red in colour ; later they became irregular in size, some slightly raised, colour becoming darker, and some did not disappear on pressure, being petechial. In two cases multicoloured stains remained in the interscapular region after the receding of the rash, as if there had been subcutaneous extravasation. The rash usually lasted until convalescence was established."

Only three were critically ill, and there were no deaths. Mental symptoms were insignificant. Stress is laid on the extreme mildness of this disease compared with " tabardillo." Of 15 cases tested by Weil-Felix 12 were positive at titres between 1 : 160 and 1 : 5,000, and 3 were doubtful (less than 1 : 80). Seven guineapigs inoculated from four patients had no fever, and 5 which were afterwards tested with known typhus virus showed no evidence of immunity. When the individual cases were studied it was sometimes possible to demonstrate close association, but there was usually only one case in a family. In 12 of the 20 families the head louse was present ; the body louse was sought but not found ; which findings are the rule in the lower Rio Grande. The Mexican physicians have recognized the existence of this disease in the last 10 years, chiefly in the summer and autumn.

The authors therefore believe that a mild strain of typhus—perhaps permanently attenuated—is endemic in the lower Rio Grande valley, and occurs sporadically. The head louse, which NUTTALL and BACOT have shown to be a race of the species *humanus*, and not specifically distinct is, it seems probable, the vector.

A. G. B.

ALQUIER (C.). **Le typhus exanthématique dans la région de Chellala (1901-1921). (Notes épidémiologiques et cliniques d'un médecin du bled.)**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 523-563. With 8 text figs. & 1 map in text.

This long paper gives an interesting clinical account of typhus in a district, inhabited chiefly by Arab nomads, south-west of Algiers. Here the natives travel for weeks without taking their clothes off, and in the numerous folds of these garments live many colonies of lice. These do not seriously incommode their carrier, who " rarely gives himself to the chase," and even when he does so contents himself with throwing the insects to some distance. Indeed, virtue is attributed to them, in that they suck " bad blood." Head lice are rare. After the war there was great prosperity, and the prosperous put their money into stock. In the spring of 1920 the rains failed, the animals were driven to marshy districts where to the ravages of famine were added those of parasitic disease ; famine and disease among the beasts was followed by famine among men, and the district became full of half-starved beggars, and deaths were very numerous. In January, 1921, typhus was reported 100 kilos away, but attempts to louse the people, at first well supported, failed from their want of persistence. The early cases were among the well-do-do and were regarded as enteric. In the first the diagnosis was " puerperal fever," then " typhoid," and only after death, " typhus." These were the cleanest people, but they had daily dealings with the beggars. Then the beggars themselves became ill, but still with the initial symptoms of typhoid, the patients not being incapacitated till the 3rd, 5th, or even a later day. Only after a month did the onset become of the classical type. The epidemic came to an end in July, because of immunization of those who escaped, the effect of summer heat on the lice, the improvement of the economic position, or the measures taken.

The author saw in the 20 years of his residence 490 cases, and 400 of these in 1921. Second attacks took place in many instances, including his own case (1916 and 1921). He gives full clinical notes for which the paper must be consulted. Two-fifths of the cases would not have been recognized unless carefully examined, and most of the patients were able to go about their business. Probably yet lighter cases were missed. Twelve per cent. died. Arteritis was quite common. A severe and unusual sequel, illustrated by several photographs, was gangrene, the result of arteritis; 14 such cases were seen, in 10 of which both feet were affected. In the person of the author the gangrene did not take place till two years after his second attack; in other cases the course was rapid.

Treatment consisted chiefly of " sun, air and water "—the prescription of the natives themselves. They refused to remain inside the hospital, but lay on the grass outside each with his vessel of water, the strong supplying drink to the weak.

A. G. B.

LEDINGHAM (J. C. G.) & FRASER (F. R.). **Tularaemia in Man from Laboratory Infection.**—*Quarterly Jl. Med.* 1924. July. No. 68. pp. 365-383. With 2 plates & 3 charts. [20 refs.]

American work on Tularaemia, the comparatively recently discovered plague-like disease of North American rodents, its causal organism (*Bacterium tularense*), and its modes of transmission between rodents and to man have already received considerable notice in this *Bulletin* (Vol. 19, pp. 442-445; Vol. 20, p. 664; Vol. 21, pp. 477 & 922).

We have here to direct particular attention to a very finished study of the historical, clinical, bacteriological and serological aspects of the disease based upon three cases of recent occurrence in London.

The patients were highly skilled members of the staff of the Lister Institute who had been handling cultures or infected animal material. The clinical features of two of the cases are described; in these the disease " was marked by the extreme slowness of the convalescence, by recurring mild attacks, and the prolonged period of over a year during which there was at least partial disability for work."

The histology of the lesions in guineapigs and mice is discussed in detail, but has already been noticed here (*Bulletin*, Vol. 20, p. 665); attention is drawn to their close resemblance to those caused by *B. pestis*. Laboratory diagnosis and serological tests also are treated very fully; for, although tularaemia has not yet been detected in rodents outside the U.S.A., it is " well to remember the possibility of some such origin in obscure cases of human infection with septicaemic features following insect bites " elsewhere.

Modes of transmission among animals and infection of man are also considered. Among laboratory workers, who rigidly observe all ordinary precautions, the authors think that a respiratory infection is possible, since animals not infrequently cough while undergoing anaesthesia, and the lungs of infected animals undoubtedly contain the virus.

A. A.

SHELTON (Turner S.). **Tularemia.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 4. Vol. 84. No. 14. pp. 1019-1020. With 2 text figs.

Report of a case from Virginia. The patient had dressed a locally-caught (not bought) rabbit about a month before her illness began. Diagnosis by agglutination test.

A. A.

FRANCIS (Edward). **Tularemia.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 25. Vol. 84. No. 17. pp. 1243–1250. With 3 text figs. [28 refs.]

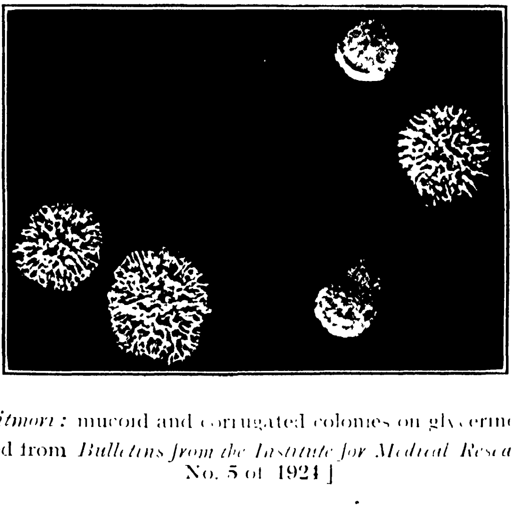
A monograph of the disease. The original material has already been noticed in this *Bulletin* (Vol. 19, pp. 442–444, and Vol. 20, pp. 664–665).

A. A.

i. STANTON (A. T.) & FLETCHER (William). **Melioidosis, a Disease of Rodents communicable to Man.**—*Lancet.* 1925. Jan. 3. pp. 10–13. With 1 fig. and *Bulletins from Inst. for Med. Res. Federated Malay States.* 1924. No. 5. 7 pp. With 9 plates [7 refs.]

ii. —— —— & KANAGARAYER (K.). **Two Cases of Melioidosis.**—*Jl. of Hyg.* 1924. Dec. Vol. 23. No. 3. pp. 268–276. With 4 plates. [6 refs.]

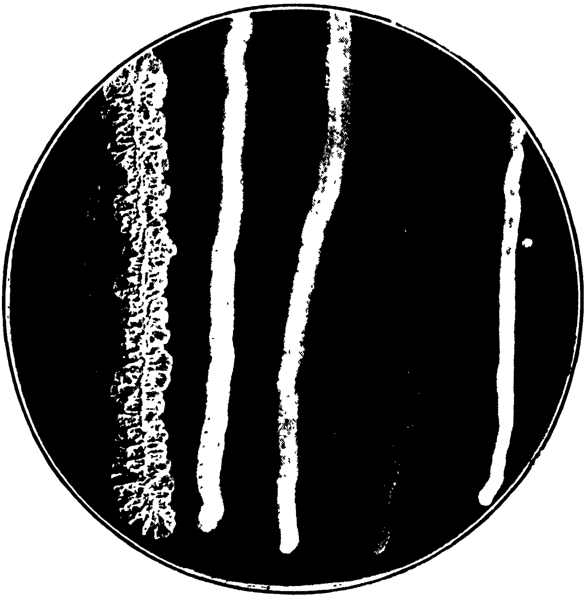
i. Melioidosis—first recognized by WHITMORE and KRISHNASWAMY, in 1912, in Rangoon, and originally described by WHITMORE, in 1913, as a "Glanders-like disease occurring in Rangoon"—is a fatal infection of rodents and man, of which up to the present only 50 human cases have been carefully observed (38 in Rangoon, 11 at Kuala Lumpur, and 1 in Singapore). Though thus apparently limited to the Burma-Malay region, it is unlikely, as the authors remark, that the geographical range of the disease is really so narrowly restricted. Of the 50 recorded cases 25 were Indians, 23 Burmans, 1 a Chinaman, and 1 a European; only 5 were recognized during life (and those only by bacteriological or serological methods) and all but 2 were fatal; and of these two, one recovered only after a long illness, and the other is still, after two years' suffering, an invalid, with sinuses and chronic suppuration in the bones of his legs and feet.



Bacillus whitmori: mucoid and corrugated colonies on glycerine agar plate
[Reproduced from *Bulletins from the Institute for Medical Research*, F.M.S., No. 5 of 1924.]

The lesions of the disease resemble those of glanders, and the causative organism originally isolated by WHITMORE is a small Gram-negative bacillus, named by the authors *B. whitmori*, about the size and shape of the bacillus of glanders, yet sometimes strongly resembling that of plague, but distinguishable from both by its active motility in young cultures, and by the characteristic wrinkled and puckered colonies formed on glycerine-agar. The bacillus is found in the lesions, as well as in the blood, sputum, urine, bile, and sometimes in the intestinal contents, and the disease can be accurately determined only by cultivation of the bacillus, since the symptoms vary according to the part or organ attacked.

How man is infected is still unsure. In Rangoon, since a large proportion of the cases were morphinics, the disease was called morphine-injectors' septicaemia and infection was supposed to be carried by the syringe; the authors, not having met with a primary lesion, and judging from the severe gastro-intestinal symptoms that so often are precursory, think it probable that infection is carried by food contaminated by rats.



Corrugated and mucoid cultures of *B. whitmori* on glycerine-agar with *B. mallei* for comparison, seventy-two hours' growth at 37°C. From left to right: *B. mallei*, strain A; *B. whitmori*, corrugated; *B. whitmori*, corrugated, *B. whitmori*, mucoid; *B. mallei*, strain, Muktesar; *B. mallei*, strain, Java.

[Reproduced by permission from the *Lancet*.]

Laboratory animals are readily infected by feeding, inhalation, scarification, and inoculation. Subcutaneous inoculation causes very rapidly fatal septicaemia; scarification is followed by local induration and caseous ulceration, subsequent suppurating lymphadenitis, and death in about three weeks; infection by feeding or by inhalation is mortal in two weeks or less, with caseous ulceration of the infected mucosa and caseous deposits in the lungs and sometimes in other organs.

There are no characteristic symptoms. "Some of the most acute cases resemble cholera or plague; others, which have a high temperature from the beginning, resemble malaria, enteric fever, or general tuberculosis; yet others find their way to the dysentery wards. If pustules and abscesses appear a diagnosis of acute glanders may be made, while the bone lesions which appear later on resemble tertiary syphilis or chronic tuberculosis. Delirium is a common symptom, and one unfortunate patient was supposed to be afflicted with acute mania."

As regards the morbid anatomy, the characteristic lesion is a small caseous nodule penetrated with fragments of chromatin and circumscribed by a zone of congestion. The nodules have been found almost everywhere except the brain, and they become confluent as large caseous masses, prominently in the lungs—this massive caseation of the contents of the thorax being a characteristic phenomenon in rats. In man, but not in animals, the confluent nodules sometimes break down into abscesses (liver, spleen) or superficial ulcers (caecum). In rats, confluent nodules in the spleen and haemorrhagic enlargement of the cervical and axillary glands often have a striking resemblance to plague lesions.

[KRISHNASWAMY (*Ind. Med. Gaz.*, Vol. 52, 1917, p. 297) speaks of having seen over 200 cases of this disease in Rangoon. He also mentions subcutaneous abscesses (distinct from ulcerations originating in wounds made by hypodermic syringes) as occurring in any part of the body. KNAPP (*Op. cit.*, Vol. 50, 1915, p. 287) in an account of a case also mentions subcutaneous abscesses and, another significant feature, ulceration of tonsils.]

ii. Neither of the cases of melioidosis here recorded was diagnosed in life. One lesson drawn by the authors from them is that this disease may sometimes have been mistaken for hepatic abscess—at any rate, in Malaya.

Case 1 was a robust Tamil cooly, about 40. He had irregular fever, pain in the epigastrium, and was constipated ; no malaria parasites, and no physical signs except enlarged spleen. Later appeared signs of consolidation at the base of both lungs, and diarrhoea. Fatal collapse at the end of the 3rd week.

At the autopsy were observed consolidated patches composed of minute suppurating tubercles in the lungs ; aggregations of similar tubercles and two circumscribed abscesses in the liver, also thickening of the gallbladder , septic infarcts and abscesses in a much enlarged spleen ; superficial ulcers in caecum. *B. whitmori* was cultivated from lungs, spleen, liver and gallbladder and verified by inoculation tests.

Case 2 was a well-nourished and muscular European of 42, who had last been living in a mining village, in a house infested with rats. Onset of illness was gradual—pain after food, occasional vomiting, diarrhoea ; fever, fluctuating at first, then never sinking below 100° F., with rigors and sweats ; no parasites in blood or stools ; liver enlarged. Death in a low delirium on 25th day.

At the autopsy two large abscesses, yielding *B. whitmori*, but not amoebae, were found in the liver, and the gallbladder was thickened. The identity of the bacillus was confirmed by inoculation tests.

The authors note that melioidosis, like tularaemia, is another item against rodents, and they also remind us that great epidemic diseases may again issue, as they must always have issued, from small and confined beginnings.

[The two diseases, melioidosis and tularaemia, seem to have many points in common—as the varied modes of infection, the septicaemic fever with a period of 2-3 weeks, the suppurative lymphadenitis following infection by scratch or prick, the miliary nodules in the viscera in a generalized infection, the pathological changes in rats (melioidosis) and guineapigs (tularaemia) strongly resembling those seen in plague (Stanton & Fletcher) and " almost indistinguishable from those caused by the plague bacillus"

(McCoy) respectively, the tardy recovery and protracted convalescence, and the difficulty of diagnosis except by laboratory methods. So far as man is concerned the infection in tularaemia seems to be more inevitably catching, and that of melioidosis more extensive and rapidly destructive locally and more severe and disastrous in its general effects; melioidosis also seems to have a predilection for the lungs, though in a fatal case of tularaemia (see this *Bulletin*, Vol. 21 [illegible]) it is recorded that nodules varying in size from a pea to a walnut [illegible] found in the lungs. The two diseases, along with glanders, appear to be species of one genus, and any one who reads the 48th chapter of Thucydides' History will be inclined to suspect that the genus in question is considerably akin to the Athenian Plague. This disease is described by Thucydides as extremely catching—" men afraid to visit each other "; cp. tularaemia; beginning with bloody tongue and throat (cp. ulceration of tonsils); going on to pain in chest, hoarseness and cough (cp. broncho-pneumonia); severe gastro-intestinal symptoms, followed later by ulceration of bowels and severe diarrhoea; small pustules and ulcers of skin (cp. subcutaneous abscesses in any part of body); and when the disease was not mortal it settled in other parts of the body, including fingers and toes (cp. slow recovery, and chronic suppuration in bones of legs and feet).

" Melioidosis " is an ugly disease, but the authors have given it an unnecessarily inelegant name. They derive their name from μῆλις (=a distemper of asses, *i.e.*, glanders), the inflexional stem of which is μηλίδ-, so that the name from this derivation ought to be melidoidosis. " Malioidosis, ' from μᾶλις, which is identical with μῆλις in meaning and has μαλί as the inflexional stem, would have been better.]

A. A.

Stanton (A. T.) & Fletcher (William). **Melioidosis and its Relation to Glanders.**—*Jl. of Hyg.* 1925. Apr. Vol. 23. No. 4. pp. 347–363. With 1 plate. [4 refs.]

This paper contains the results of cultural and serological comparisons of the glanders bacillus (*B. mallei*) and the melioidosis bacillus (*B. whitmori*) along with some comparative experimentation on animals. Five strains of *B. mallei* of widely diverse geographical origin were compared with 14 strains of *B. whitmori* of diverse animal derivation from Kuala Lumpur and Singapore.

It is impossible to distinguish the lesions of melioidosis from those of glanders even by the microscope. Clinically the two diseases are alike, but melioidosis is generally more fatally acute. All attempts to infect horses with melioidosis have been unsuccessful.

The serological reactions tested (agglutination, absorption and complement-fixation) showed that the cultures of *B. whitmori* were homogeneous, but that the five strains of *B. mallei* could be separated into two sub-groups. One of these sub-groups, comprising strains from Java and Muktesar (N. India), is very closely related, serologically, to *B. whitmori*; the other sub-group, comprising three strains of diverse origin from the Lister Institute collection, is only distantly related to *B. whitmori*.

The authors' conclusion is that the causative organism of glanders is not always one and the same; that a group of organisms having different serological properties has been included under the name *B. mallei*, and that *B. whitmori* is a member of the group found in rodents and man.

A. A.

COLEMAN (R. B.) & BATEMAN (J. E.). **Splenectomy in Egyptian Splenomegaly. Seventy Cases.**—*Lancet.* 1924. Nov. 29. pp. 1116–1117. [6 refs.]

The authors are in charge of the C.M.S. Hospital, Old Cairo, where 20,000 patients from all parts of Egypt attend yearly. They find that splenomegaly is most common on the eastern side of the Delta; the majority of operation cases come from near Zagazig and Dekernes. The average age of the 70 cases, all but 13 being males, was 19; they believe the sex disparity to be a real one and note that bilharziasis also affects chiefly males. Most splenomegaly cases develop ascites and extreme hepatic cirrhosis a few years later.

The blood was usually examined after treatment for ankylostomiasis and bilharziasis. The average was: Red count, 4,000,000; colour index, 65; leucocyte count, 3-4,000. A considerable leucocytosis is believed to be a bar to operation, but the authors have removed spleens with success from 10 patients with cell counts between 7 and 10,000. Only two cases of leukaemia were discovered in this series.

The 70 cases, all seen between 1920 and 1923, represent the cases suited for operation; an equal number were refused owing to ascites, pellagra, heart disease, or debility. An injection of pneumococcal vaccine is always given the night before operation; before this precaution two cases were lost from pneumonia. For details of the operation the paper must be consulted. The spleens removed averaged 3¾ lbs. (extremes, 1¼ and 12½ lbs.). The total mortality was 11, or 15·7 per cent.; nearly all the deaths occurred between the second and fourth day, and were considered to be due to late shock. A "fair number" of operation cases have been traced and examined: they were nearly all well and strong, and in none has ascites appeared.

The authors conclude "that splenectomy is the most satisfactory treatment of Egyptian splenomegaly, that great care is essential in the selection and preparation of cases, that the mortality is still high, but untreated cases so early develop extreme ascites that the operation is justifiable, that a small degree of leucocytosis is not necessarily a contra-indication to operation."

[The paper is a model of conciseness. The authors were evidently unaware of the recent work of DAY (this *Bulletin*, Vol. 21, p. 938).]

A. G. B.

CHIANG (H. T.). **Splenomegaly with Ascites.**—*Nat. Med. Jl. China.* 1924. Dec. Vol. 10. No. 6. pp. 387–390.

Splenomegaly with ascites seems to be not rare in Wu-Han, and its exact causation requires study. The author has observed 30 cases from the parasitological aspect, 10 being urban and 20 from the country, and the ages ranging from 17 to 64 years; parasites were found in 77 per cent. of them, very often mixed infestations. The parasites observed were *Schistosoma japonicum* (56·5 per cent.), *Ancylostoma duodenale, Ascaris lumbricoides, Trichocephalus trichiuris, Fasciolopsis buskii,* and *Entamoeba histolytica. S. japonicum* occurred in all but four instances as a mixed infestation, and in the author's experience such mixed cases are hard to cure—are, perhaps, not curable—though they may be improved for a time by tartar emetic.

A. A.

SPACKMAN (W. C.). With Pathological Notes by MACKIE (F. P.). **Gaucher's Type of Splenomegaly in a Mahratta Village, with a Case treated by Splenectomy.**—*Indian Med. Gaz.* 1925. Feb. Vol. 60. No. 2. pp. 69–72.

A village near Nasik, formerly inhabited by 400 people, Mahrattas and others, was abandoned because of a disease which carried off a number of young male Mahrattas and earned for the village the name of "potedhagur" (*pote*=big stomach). The disease begins early with a lump in the left side, always in Mahrattas, and is ultimately fatal. Malaria is well known here; kala azar is absent. A table shows the distribution of 12 cases in 3 families, all males, and in one family 4 brothers. The commencement was between the ages of 1 and 15, and life was rarely prolonged more than 15 years. Only one case was seen by the author.

A boy of 16, with complaint of abdominal tumour and weakness, beginning at the age of 6. A low type of fever more or less continuous. No pain. Father and brother died of the same disease. Face puffy: conjunctivae moderately anaemic, spleen and liver visibly enlarged; some ascites. Lower end of spleen reaches left iliac fossa; it is hard and not freely moveable. Lower edge of liver 3 fingers breadths below costal margin. No oedema. No palpable enlargement of other lymphatic tissue. Urine normal. No malarial parasites in blood. No leukaemia. Wassermann negative. Aldehyde test for kala azar negative. Six weeks after admission spleen was removed. There were troublesome adhesions to diaphragm, abdominal wall and intestines. Spleen weighed 3 lbs. 3 oz. Patient left hospital three weeks later, and was seen after another month, when the liver was smaller.

Colonel Mackie remembers seeing similar cases at Nasik in 1907, and helping to remove the spleens of two. He says that such cases are common in India, and are not malaria or kala azar or of schistosome origin, and this was not one of MEGAW's peritonitis cases the result of dysentery (this *Bulletin*, Vol. 21, p. 688). There remains Gaucher's familial splenomegaly. The leucocyte count was: Polynuclears, 59; lymphocytes, 30; large mononuclears, 8; eosinophiles, 3. The red cells were normal.

"The sections of the spleen showed moderate thickening of the capsule but no increase in the fibrous trabeculae. The Malpighian corpuscles were decidedly reduced in number, and some were undergoing a hyaline change. The general appearance under the low power suggested an alveolar arrangement of the splenic parenchyma and great reduction in the lymphoid tissue. The alveoli were seen to contain numbers of large polyhedral cells of endothelial type with large circular feebly-staining nuclei.

"No Leishmania or other parasites could be seen and the general structure was light and open and not at all resembling the dense hyperplasia and fibrosis usually seen in protozoal diseases. These characters in general and the overgrowth of endothelial cells in particular decided one in regarding the disease as that of Gaucher's type of splenomegaly."

A. G. B.

VILLALOBOS (Nino). **A Case of Spontaneous Rupture of the Spleen.**—*Jl. Trop. Med. & Hyg.* 1924. Nov. 15. Vol. 27. No. 22. pp. 307–308.

The patient, a coloured man at Port Limon, Costa Rica, was admitted to hospital with severe pain in the abdomen. Eight days before he was awaked at 11 p.m. by a sharp, cutting sensation in the abdomen and nausea.

On admission his attitude suggested intense pain ; he sat upright with head and shoulders bent forward. Respirations 28, pulse 100. There was rigidity of the muscles over the left superior quadrant with abdominal tenderness, general but more definite in that region, and dulness on percussion in the left flank, where a clear friction sound was both audible and palpable. No malarial parasites found. Hemoglobin 50 per cent. Leucocytes, 180,000, and the next day 250,000. On operation two rents were found on either side the hilum and 500 cc. of liquid blood in the peritoneal cavity. The slightly enlarged spleen was removed and the patient died.

The author draws attention to the presence of Ballance's sign—dulness in the left flank not varying when the position is changed—and to the great leucocytosis. He considers that malaria and typhoid need not be considered in this case. Leukaemia, a cause of ruptured spleen, may have been present ; no differential count or autopsy was made.

A. G. B.

WELLS (Herbert S.). **The Absorption and Excretion of Carbon Tetrachloride in Animals and in Man.**—*Proc. Soc. Experim. Biol. & Med.* 1925. Jan. Vol. 22. pp. 235–237. [1 ref.]

Absorption was studied in dogs after injection of 3 cc. of CCl_4 into loops of intestine, duodenum and colon being tied off under general anaesthesia. The dogs were killed at intervals up to 30 hours and the amount of the drug remaining in the gut determined. The whole dose was absorbed in 24-30 hours. When 50 per cent. alcohol is added, up to 100 cc. there is no tendency to increased absorption, but with 97 per cent. alcohol absorption is decidedly accelerated in the first few hours. The addition of 10 cc. saturated mag. sulph. slightly decreases the amount absorbed. When the expired air of dogs is passed through activated charcoal a very high percentage of the CCl_4 absorbed from an intestinal loop is shown to be rapidly excreted by the lungs, in one case 96 per cent. The author found that in himself the drug was more rapidly absorbed and excreted than in dogs. The maximum rate of excretion coincided with the greatest intensity of subjective sensations of dizziness and of the odour of the substance in the breath ; thereafter the rate fell rapidly, the curve reaching the base line in 24 hours. The rate of absorption in man is thought to depend on the concentration of the drug in the small intestine. SCHULTZ and MARX suggest that absorption is most rapid from the duodenum and less so further down the gut, but this is not the case in dogs. If the rapidity of absorption depends on concentration, toxicity might be reduced by giving the drug in divided doses, and prolonging its presence in the intestine.

A. G. B.

GARDNER (George H.), GROVE (R. C.), GUSTAFSON (R. K.), MAIRE (E. D.), THOMPSON (M. J.), WELLS (H. S.) & LAMSON (Paul D.). **Studies on the Pathological Histology of Experimental Carbon Tetrachloride Poisoning.**—*Bull. Johns Hopkins Hosp.* 1925. Feb. Vol. 36. No. 2. pp. 107–133. With 6 figs. [18 refs.]

The drug used in these experimental studies was chemically pure CCl_4, and the animals used were dogs that appeared to be healthy, and some puppies and rabbits for comparison. Autopsies were made both on animals dead from poisoning by CCl_4 and on animals killed at specified times after administration of the drug. The main conclusions from the experiments are that CCl_4 causes central necrosis of the liver lobules when given by mouth, by inhalation of vapour, by subcutaneous injection, intraperitoneally, or by rectum. This necrosis has been observed as early as 12 hours after oral administration, and the maximum lesion occurs about 48 hours after ; healing begins 3 or 4 days after oral administration and is not complete in 5 weeks. The smallest oral dose that produced necrosis was 0·5 cc. per kgm. in one series of experiments, and 0·176 cc. per kgm. in another. After oral administration evidences of real nephritis appeared not more frequently than would be found in any large series of dogs. The authors were never struck by the presence of adrenal lesions.

Simultaneous oral administration of alcohol and 4 cc. CCl_4 per kgm. to adult dogs greatly increased the effect of the CCl_4, as shown by tremendous liver destruction and high death rate. Administration of fatty substances cream, olive oil, paraffin oil—with CCl_4 did not much affect either the liver necrosis or the death rate. Intraportal injections of CCl_4 produced only diffuse haemorrhagic liver necroses, and injections into a peripheral vein produced only foci of haemorrhage, oedema, and an occasional patch of necrosis, in the lungs.

A. A.

TAYLOR (Harden F.). **A Case of Hypersensitiveness to Carbon Tetrachlorid.**—*Jl. Amer. Med. Assoc.* 1925. Jan. 24. Vol. 84. No. 4. p. 280. [2 refs.]

The author used carbon tetrachloride to remove from his hands some bituminous belt-dressing used in the laboratory. By night the hands were swollen and itched intensely. Next day they could not be used and were blistered, "small globular sacs deep in the skin, mostly never breaking." The inside of the mouth was "almost as if burned by hot soup." Other poisonings followed when the hands were exposed to vapour of carbon tetrachloride. Such hypersensitiveness may be the cause of untoward effects of this drug. The author is very sensitive to iodoform also.

A. G. B.

STRAUB (W.). **Zur therapeutischen Beherrschung des Oleum chenopodii.** [The Safe Administration of Oleum Chenopodii.]—*Klin. Woch.* 1924. Oct. 28. Vol. 3. No. 44. p. 1993. [1 ref.]

Apropos the case of a child which received oil of chenopodium on two consecutive days " 3 times daily," and died with symptoms of inflammation of intestines, liver and kidneys, and other fatal cases in Germany, the author discusses this drug and the technique of its administration. The most important point is to prevent absorption, and the death in the case mentioned was probably due to the " 3 times daily." It should be given in a single sufficient dose, its removal accelerated when its work is done, and it should be repeated only after a sufficient interval. The technique advised by W. E. DEEKS in the United Fruit Company Report (1923) is quoted with approval. In Germany, the drug is put up under fancy names in gelatine capsules and dosage adjusted to age is rendered impossible ; nearly always there is a second ingredient such as santonin ; the keeping properties are unknown and before the capsule reaches the patient decomposition may have occurred. The drug should be ordered *ad hoc* from the druggist in appropriate single doses. Owing to its volatility, the author regards carbon tetrachloride as much more dangerous than oil of chenopodium given advisedly.

A. G. B.

BRAUN (Carl). **Tödliche Vergiftung durch Chenopodiumöl (sog. amerikanisches Wurmsamenöl).** [Fatal Poisoning by Oil of Chenopodium.]—*Muench. Med. Woch.* 1925. May 15. Vol. 72. No. 20. pp. 810–811. [16 refs.]

To a child of 22½ months suffering from round worms the mother gave, in the afternoon and evening, 3 drops of oil of chenopodium, and in the morning, 6 drops. Two hours later the child vomited, and later a number of worms were passed. In the evening a doctor found the child in coma with dilated pupils and infrequent pulse and respiration. Death occurred 15 hours after the vomiting. The autopsy revealed nothing to account for death, and none of the usual signs of chenopodium poisoning; no trace of oil was found in the organs, but the bowels had acted freely. The case is regarded as one of overdosage.

A. G. B.

i. FOLEY (H.) & CÉARD (L.). **Sur des cas d'empoisonnement causés par une liliacée des régions sahariennes** (*Ornithogalum amoenum* **Batt.**).—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 507–516. With 3 figs on 1 plate & 1 chart in text. [3 refs.]

ii. MUSSO (M. L.) & PERRIN (M.). **Etude du bulbe d'***Ornithogalum amoenum*.—*Ibid.* pp. 517–522. With 4 text figs. [5 refs.]

i. In 1921, in the detention camp (Compagnie de discipline) at Colomb-Bechar, 12 men out of the effective of 70 were admitted to hospital for weakness and emaciation or chronic diarrhoea, and 7 deaths were attributed to cachexia, the result of obstinate diarrhoea. In these cases blood was usually present in the stools. The heart was affected early and was slowed to 50 or even 40 beats. The development of the disease was rapid. Post-mortems revealed congestion, sometimes extreme, of the digestive tube; the greater curvature of the stomach was sometimes ulcerated; the small intestine had in some instances an ecchymotic aspect. The mesenteric glands were swollen. There was congestion of liver, kidney and lung. It was concluded that the signs pointed to the ingestion of some irritant or toxic substance. An enquiry led to the discovery that to avoid the company routine the men had eaten the bulbs of a Liliaceous plant allied to Scilla growing in abundance in the neighbourhood. This was *Ornithogalum amoenum*, known to the natives to be poisonous. Experiments performed on dogs to which the minced bulbs were fed caused death in 5-6 days with lesions of acute haemorrhagic gastro-enteritis and marked congestion of liver and kidneys. In a similar experiment with squill it was the kidneys that were chiefly affected.

ii. The chemical composition of the bulbs was studied. Toxic principles, probably alkaloids, were found. Search for glucosides was negative. Further work is required.

A. G. B.

MELNOTTE (P.). **Un cas de septicémie à bacille pyocyanique.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 458–461. With 1 chart in text.

The patient in this case was admitted with a temperature of 41° C., abdomen tender on pressure, pain in liver, spleen slightly enlarged, and congestion at base of both lungs. There was slight diarrhoea, but no stupor. On the 4th day *Bacillus pyocyaneus* was isolated from a blood culture. Culture of stools, serological tests, and microscopic examination of blood gave no particular revelations. After administration of an iodized autovaccine the temperature began to fall and convalescence proceeded normally from the 21st day, though interrupted by an attack of benign tertian malaria that was cured immediately by quinine. A rabbit of 2 kilos, which received 1 cc. of the culture of *B. pyocyaneus,* died in 32 hours. It seems therefore that the patient's condition in this case was due to an infection with *B. pyocyaneus* although no suppurating wound could be discovered.

A. A.

TOUBERT. **Sur un cas d'éruption polymorphe consécutive aux morsures d'hirudinées, à Lai-Châu (Tonkin).**—*Ann. de Méd. et de Pharm. Colon.* 1924. Sept.-Oct.-Nov.-Dec. Vol. 22. No. 3. pp. 415–418.

The patient in this case was a European who, about a week after his return from an expedition during which he had suffered from the bites of land-leeches, was severely attacked by "tropical" malarial fever that left him prostrate. In this condition an extensive area around the three-weeks-old scars of two leech-bites on the right shin suddenly became the scene of an excruciatingly painful purplish swelling, soon followed by a copious herpetiform eruption, the vesicles of which were sanguinolent. During 15 days there were three crops of this intolerable eruption over the field of inflammation, but, after that, convalescence (under treatment) was rapid and at the end of a month only large brown pigmented scars remained. The author attributes the bloody vesiculous eruption to some latent or dormant haemolytic toxin from the leech-bites which took effect as soon as the patient's natural resistance was defeated by the malaria.

A. A.

HOLLAND (H. T.). **A Case of Gangosa in Baluchistan.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 406–407. With 3 figs.

The case of a man, 18 years of age, suffering from gangosa is related, the first case, so the author believes, to be recorded in India. The disease started four years before as a pimple, at the side of the nose, which ulcerated, the process spreading about the nose and both lips, followed by scarring and contracture so that only two small apertures, half an inch in diameter, gave access to the buccal cavity. His previous history included a visit to Mesopotamia at 9 years of age, but he had never had any previous illness, and there was no history of either acquired or inherited syphilis [nor presumably of yaws]. The Wassermann reaction was definitely positive: a differential blood count normal. Operative treatment to restore the mouth aperture was successful.

Microscopic examination of tissues was negative for bacilli, spirochaetes and leishmania.

H. S. Stannus.

D'ALMEIDA (João). **Tratamento cirúrgico da elefantiase.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 495–510. With 8 figs. [7 refs.]

This paper, after giving a résumé of the various surgical methods of treating elephantiasis, describes an operation, or rather a sequence of operations, devised by Professor Teixeira BASTOS, for the details of which the reader must consult the original paper, but briefly we may say that it appears to be an adaptation of KONDOLEON'S operation. A long elliptical section is removed on the inner aspect of the leg and by union of the edges pressure is exerted on the tissues below, which forces the lymph to flow through the aponeurotic layer at a higher tension and the venous stream passes by the deeper vessels. Notes are given of four cases and there are five diagrams illustrative of the method.

H. Harold Scott.

JAME (L.). **Un cas d'éléphantiasis du membre inférieur chez un arabe nomade des hauts-plateaux.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 462–467. With 3 text figs. [13 refs.]

According to the author the elephantiasis observed in Algeria is not of filarial origin, and the only microfilaria that has yet to come to notice—and that only once—is *perstans*. The case of elephantiasis here reported was typical of the disease as it occurs in Algeria and Morocco, in the absence of filaria embryos, the normal leucocyte formula, the infiltration of the thickened skin with sanguineous serum, and the presence of micro-organisms (apparently having no aetiological significance) in this serum.

A. A.

GRAHAM (George S.). **A Case of Sickle Cell Anemia with Necropsy.**—*Arch. Intern. Med.* 1924. Dec. 15. Vol. 34. No. 6. pp. 778–800. With 4 text figs. [8 refs.]

This is a careful clinical study and an extremely laborious and comprehensive post-mortem investigation, macroscopic and microscopic, of a case of sickle-cell anaemia (cp. *Bulletin*, Vol. 21, p. 670 ; Vol. 20, p. 670 ; and Vol. 7, p. 329), confirming the view that this disease is a definite entity, demonstrable by clinical and laboratory methods and evidenced post-mortem by lesions of the haemopoietic system. The author concludes that it appears to be a racial condition brought into evidence by exciting agents, of which suspicion is directed particularly towards a streptococcus. The following is the author's summary of the gross and microscopic changes :—

"Acute streptococcic bronchopneumonia with early empyema ; streptococcic bacteraemia ; anaemia associated with sickling deformity of the red blood cells ; icterus ; splenic atrophy ; splenadenoma ; chronic osteomyelitis with repair and hyperplasia of marrow and osseous tissue ; chronic periostitis and osteitis of tibia ; acute intracapillary and chronic productive capsular glomerulonephritis ; chronic hepatitis ; metastatic haematopoiesis in liver, spleen, and lymph nodes ; haemosiderin pigmentation of liver and kidney ; chronic pretibial skin ulcer ; cholelithiasis."

A. A.

MOSER (R. Allyn) & SHAW (William J.). **Sickle Cell Anemia in Northern Negro.**—*Jl. Amer. Med. Assoc.* 1925. Feb. 14. Vol. 84. No. 7. pp. 507–508. With 1 fig.

All the cases of sickle-cell anaemia, about 100, hitherto reported have been in negroes of the Southern States; the case here briefly abstracted relates to a negro, with some admixture of Indian blood on the mother's side, from northern Kansas. This appears to be the chief point of interest.

A. A.

RODHAIN (J.). **Une épidémie de poliomyélite aiguë au Congo Belge.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 331–367. With 3 plates and 1 folding map. [7 refs.]

A full account of an epidemic of poliomyelitis that occurred in the Belgian Congo in 1919-20—the first such occurrence since the European occupation of the country. Not only infants and children, but also young adults over 20 years of age were attacked. The almost constant prodromata of an attack were fever and diarrhoea or abdominal cramps—also somnolence, particularly marked in abortive cases. Both clinically and experimentally the disease conformed to the type elucidated by HEINE-MEDIN, and defined by WICKMAN. The mortality attained 27 per cent., or, if the considerable number of adult cases be included, 23·9 per cent. Malaria did not predispose to an attack, but trypanosomiasis certainly did, and, conversely, an infection of poliomyelitis precipitated the declaration of trypanosomiasis. Though it is possible that the infection might have been introduced, it is much more likely that it spread from one of the endemic foci in the Lower Congo.

A. A.

DE BOER (H. S.) & ALLEN (G. V.). **Acute Lymphatic Leukaemia in a Native.**—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 248–249.

The patient was admitted to hospital at Mombasa with fever and a large spleen, the provisional diagnosis of typhoid fever was not confirmed by the agglutination test and quinine was given till his death on the 21st day. The spleen enlarged progressively till it almost filled the abdomen. The authors remark that lymphatic leukaemia is apparently rare in Africans and note that pyrexia and a large spleen do not necessarily mean malaria or enteric.

A. G. B.

CHESTERMAN (Clement C.). **Myelogenous Leukaemia in a Negro: Failure of Tryparsamide.** [Memoranda.]—*Brit. Med. Jl.* 1925. Apr. 11. p. 694.

The spleen was much enlarged; no swellings of lymphoid tissue were detected. The leucocytes in six estimations were about 450,000; polymorphs 39 per cent., myelocytes 33, large mononuclears 19, lymphocytes 5; erythrocytes, 2,950,000, with normoblasts and megaloblasts. A total of 12 gms. tryparsamide given in 14 days had no beneficial effect; and did not cause amblyopia, though this would almost certainly have occurred in a case of trypanosomiasis with central nervous infection.

A. G. B.

MATTLET (G.). **Bronchomycoses dues à des Sterigmatocystis dans l'Urundi. Communication préliminaire.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 167–176. With 3 figs.

The author describes five cases of chest affection in natives with cough and expectoration, in which he found the spores of a fungus which he grew on artificial media. He was unable to find any acid-resistant bacilli and attributes the symptoms to the fungus, though in one instance the symptoms disappeared while the fungus persisted. The cases were treated with iodide of potassium and emetine.

A. G. B.

GOMES (J. M.). **Mycose broncho-pulmonar**—*Monilia Butantanensis* **(n. sp.).**—*Ann. Paulist. Med. e Cirurg.* 1924. Oct. Year 12. Vol. 15. No. 10. pp. 246–251.

From the sputum of a patient presenting the signs and symptoms of phthisis the author isolated a mycotic organism which developed well on glucose agar as a white, soft, pasty growth. It fermented, without production of gas, saccharose, glucose, arabinose, galactose, dextrin, maltose and laevulose, but not mannite, lactose or inulin. Inoculation of the sputum into a guineapig and three small rats yielded no results; similarly with peritoneal inoculation of the pure culture. Intravenously, however, it caused death in 3-4 days with expulsion of blood-stained froth from the mouth and nose. The fungus, consisting of round or oval yeast-like cells and short mycelia, was found in and cultured from the lungs, spleen, kidney and liver. The organism is classed among the Monilia and named by the author *Monilia butantanensis.*

H. Harold Scott.

CHOPRA (R. N.), assisted by DE (Premankur). **A Preliminary Note on the Pharmacological Action and Therapeutic Properties of Kuth Root.**—*Saussurea lappa.*—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 540–544. With 2 graphs. [3 refs.]

Saussurea lappa is a Composite plant growing in the north-western portion of the Himalayas, especially in Kashmir. It is well known in the native systems of medicine; the roots are dug up in large quantities and shipped from Calcutta and Bombay to China and the Red Sea. It is the chief ingredient in an astringent stimulant ointment, is a powerful aromatic stimulant used in cholera, protects Kashmir fabrics from moth, and in China is used as incense. Its chemistry and pharmacological action were studied. The active principles prove to be an essential oil, a glucoside and an alkaloid, the first two being the pharmacologically active bodies: the essential oil has strong antiseptic and disinfectant properties; the glucoside causes a small but persistent rise of blood pressure; and both have a slight but definite broncho-dilatory effect. The powdered root and alcoholic extract are expectorant, and are beneficial in asthma. The drug has no anthelmintic properties. The authors state that they tried the alcoholic extract in a series of cases of asthma and found that it had not only a remarkable effect in relieving the spasm but also prevented recurrence of attacks, loosened the phlegm and cleared the respiratory passages. "All our asthmatic patients benefited under this treatment."

A. G. B.

CHOPRA (R. N.) & CHANDLER (Asa C.). **Indian Santonin. Extracted from the Indian Species of** *Artemisia maritima*.—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 537–540. [6 refs.]

Santonin, the authors say, costs in India as much as Rs. 720 per lb., or 3 grains for a rupee. It comes from Russia via Europe, and is obtained from *Artemisia cina* and other species growing in the Kirghiz, in Turkestan. Recently, owing to disturbance in Russia, the drug has been scarce. The Indian species, *A. maritima*, grows in the Western Himalayas at 4,000-12,000 ft. between Kumaon and Kashmir, and also in Baluchistan and Afghanistan, and santonin has been extracted from it by a firm of pharmaceutical chemists in Calcutta; the plant is found to contain about 0·5 per cent. santonin, as against 1·2-1·4 per cent. for the Russian product, but the yield is believed to vary with the time of year. Chemical tests showed that the Indian differed little from the imported santonin, and clinical trials on 26 cases showed it to be harmless and effective in the expulsion of ascarides. At present the Kashmir santonin costs 670 rupees per lb., but a large demand would reduce the price.

A. G. B.

ZOELLER (Chr.). **Immunité de race vis-à-vis de la scarlatine. La réaction de Dick chez les sujets de race jaune.**—*C.R. Soc. Biol.* 1924. Dec. 19. Vol. 91. No. 36. pp. 1315–1317. [1 ref.]

[DICK and DICK, at Chicago, separated a toxic filtrate from cultures of haemolytic streptococci from scarlet fever. This filtrate gives an intracutaneous reaction in persons presumably susceptible to scarlet fever, is neutralized by serum from scarlet fever convalescents and gives no skin reaction with these or in persons who have had scarlet fever some time before.]

The author says that it appears clearly established that the Anglo-Saxon [? white race] is hyper-receptive to scarlet fever, whereas the yellow race is only exceptionally so [this is not the case among the northern Chinese, *ante*, p. 151]. The author tested the two races in Annam. Whereas in the white race there were 38 positives out of 125, among 50 Annamites only 4 were positive, and those very feebly so. Examination of 10 Annamite serums showed some to contain antitoxin, either naturally or acquired by contact with scarlatinal virus; in others the immunity seemed to correspond to a kind of indifference of the tissues for streptococcic toxin or to neutralization of the toxin on the spot by a process of local defence. In any case, the experiments show that the threshold of immunity is higher in the European than in the Annamite.

A. G. B.

DE SOUZA (Salazar) & TEIXEIRA (C. Coelho). **La symbiose fuso-spirillaire.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 343–347.

The writers have investigated 29 cases of an ulcerative stomatitis (Vincent's angina), the features of which they differentiate from noma, and have found the fuso-bacillary-spirillum infection in all of them. In 23 of the cases they also examined the cerebrospinal fluid, in which they observed hypertension and hyperalbuminosis in 95·6 per cent., a moderate lymphocytosis in 95·6 (or even 100) per cent., and a positive Bordet-Wasserman reaction in 90 per cent. They therefore regard the fuso-bacillary-spirillum as pathognomonic of a generalized infection, of which this form of ulcerative stomatitis is a local manifestation.

A. A.

ROBINEAU (Marcel). **La pratique de l'avortement. Coutume des indigènes du Cameroun.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a, 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 105–109.

Provoked abortion is common in Cameroon. A case is described of a young woman who, married very young to a much older man, disliked her husband, and had interrupted four pregnancies in the hope of his exchanging her for another wife. Analogous cases are said to be common, and abortion to be the most frequent cause of metritis in native women. The causes of this custom, which is unknown to the men, are the marriage of young girls and system of polygamy. The methods used include vaginal injections of infusions of *Tephrosia vogelii* and *Erythrophloeum guineense.* The remedies are the interdiction of very early marriages and the gradual introduction by Christian missions of monogamy.

A. G. B.

LOEVENBRUCK (L.). **Quelques cas d'abcès de la rate chez le noir.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 177–184.

In the first three months of 1924 four cases of splenic abscess, three in males, were admitted to hospital at Panda, and a fifth in which a white infarct was found in the spleen.

In case 1 the symptoms were enteritis and pain in the left side; the temperature varied between 37° and 38·5° C. Enteric fever was suspected. Owing to dulness and absence of air entry on the left side of the chest a needle was inserted between the 9th and 10th rib in the scapular line and pus withdrawn. On operation the pus proved to be not in the thorax, but below the diaphragm; the patient died. At the autopsy the spleen was found to be riddled with abscesses. No other lesion was discovered and no amoebae. In case 2, admitted with fever and diarrhoea, attention was not drawn to the splenic region for nearly three weeks, when splenic abscess was diagnosed. On laparotomy fetid gas and chocolate-coloured pus escaped from a cavity the size of a child's head. No amoebae were found. The patient recovered. In case 3 there was a swelling in the hypogastrium, which on incision gave vent to a litre of chocolate pus. The cavity was cleansed and the abdomen closed, but the abscess refilled; signs now appeared, without pain, in the splenic region, and a fresh opening gave exit to 2 litres of pus. Later there was evidence of intestinal perforation, but the patient recovered. In the 4th case splenic abscess was diagnosed and, again, foul-smelling gas and nearly 2 litres of pus were evacuated. In the 5th case, brought-in-dead, there was an abscess the size of a walnut in the spleen, and peritonitis.

It is suggested that these patients had septic thrombosis of the splenic vessels, of intestinal origin. No microbes were seen in the pus. Two of the patients walked into hospital and none made any great complaint. For the operation a simple incision under local anaesthesia and a drainage tube sufficed. [Compare WALLACE's experience of splenic abscess in Northern Nigeria, this *Bulletin,* Vol. 19, p. 616.]

A. G. B.

STERN (E.). **Durchbruch eines Lienalabszesses durch die äussere Abdominalwand.** [Rupture of Abscess of Spleen through the Abdominal Wall.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 1. pp. 44–46.

The patient was a boy of 3 years in Palestine who had suffered from malaria since birth. The liver was enlarged, the spleen reached the inguinal region on the left, and crossed the navel line. One morning an abscess was found to have burst. The opening was enlarged and dressings applied, and in 6 weeks the wound was soundly healed. Afterwards there was no trace of splenic enlargement.

A. G. B.

KHOURI (J.). **Recherches sur l'hématurie en Egypt.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 811–818. [5 refs.]

The author, in the course of 20 years at Alexandria, has studied 591 cases of haematuria; he gives the following table:—

Haematurias observed in Egypt (1904-1924).

Number of urines examined ... 48,355
Number of haematurias observed... 591 = 1·2 per cent.
Male ... ... 541 = 91 ,, ,,
Female ... 50 = 9 ,, ,,

Number of cases observed.		Nature and cause of haematuria.	Percentage.
310	...	Bilharziasis	52·5
40	...	Filariasis	7·0
12	...	Cancer	2·0
1	...	Tuberculosis	0·2
95	...	Nephritis and pyelonephritis	16·0
3	...	Calculous pyelitis (uric acid)	—
7	...	,, ,, (calcium oxalate)	—
3	...	,, ,, (mixed)	5·7
6	...	,, ,, (triple phosphate) ...	—
15	...	,, undetermined	—
7	...	Lithiasis (uric)	—
31	...	,, (oxalic)	11·5
3	...	,, (mixed)	—
27	...	,, (phosphate ammonium, magnesium)	—
6	...	Prostatitis, acute infections, septicaemias ...	—
25	...	Undetermined causes	4·1

In endemic foci of bilharziasis the proportion owning that cause would be much greater. He draws attention to the low incidence in women [but does not state what proportion of his clientèle they formed]; of the bilharziasis cases women formed only 6 per cent. In all the 310 cases *S. haematobium* was in question. In four, eggs with a lateral spur were seen also in the urine; it is noted that two of these patients had chronic dysentery, and it is considered probable that the urine in the four instances was soiled with faecal matter, and that there was a double infection. Albuminuria was always present, but in some cases out of all proportion to the amount of blood and pus. Nephritis and pyelonephritis were rare in bilharzial infections. Natives formed 92 per cent. of the cases of bilharziasis.

In the haematurias due to filariasis (*F. bancrofti*) women formed 15 per cent. ; haematochyluria accounted for 92 per cent. of all cases. There was never any renal complication.

The author discusses urinary amoebiasis at some length. He notes that the urine is an unfavourable medium for the Entamoeba, and evidently believes this affection to be much rarer than do other Egyptian physicians. In three specimens of urine from pyelitis cases and three from amoebic dysentery he was unable to find the amoeba, though specific treatment had not begun. Two cases sent to his laboratory as urinary amoebiasis proved to be, one a new growth and the other bilharzial cystitis. This man recovered under emetine treatment and he suspects that such improvement often accounted for the diagnosis of urinary amoebiasis ; his urine was examined frequently but amoebae were never seen. Only those cases in which the amoeba has been recognized and studied with the modern technique should be labelled urinary amoebiasis.

A. G. B.

FORSYTH (J. M.). **Tropical Ear.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 61–76. With 1 coloured plate.

An informative article, with details of auriscopic appearances and local treatment, which cannot be adequately summarized. The author defines " tropical ear " as a localized infection of the external auditory meatus which does not involve the middle ear, but sometimes, though rarely, extends into it. He considers it under the heads, otomycotic and bacterial. Of 15 otomycotic cases 14 were due to an Aspergillus, and 1 to a yeast, and of the aspergillus cases there were 4 distinct colour varieties. Of the bacterial division the most important subdivision is " true tropical ear," an acute affection causing great pain with deep-seated pus formation, and caused by *B. pyocyaneus.* Illustrative cases are given. A differential diagnosis table and a series of coloured illustrations of the appearances seen with the auriscope are given.

A. G. B.

WOOD (John Y.). **Report on Ankylostomiasis, Beri-Beri, Amoebiasis, Filariasis, Leprosy and Bilharziasis in Freetown Prison.**—*Sierra Leone Ann. Med. & San. Rep. for the Year 1923.* pp. 62–65.

Ankylostomiasis.—A single specimen of faeces from each prisoner was examined and, if negative in plain smear, was mixed with saturated salt solution as described by WILLIS (this *Bulletin,* Vol. 19, p. 246). Of 252 prisoners examined, 166, or 65·9 per cent., were positive, and were treated by (*a*)beta naphthol grs. 40, followed in an hour by thymol grs. 30. and Mist. alba four hours later ; (*b*) carbon tetrachloride m. 30-45 " on bread " ; (*c*) eucalyptus oil, castor oil and chloroform mixture. The numbers are small, but the first method was the most effective, and the third was useless.

Beriberi.—There were 63 cases in 1922-3, of which 3 died. The symptoms are analysed. The chief were : Oedema, 74 per cent. ; absent knee jerks, 63 ; change of cardiac rhythm, 50 ; cardiac dilatation, 47 ; valvular changes, 46 ; Romberg's sign, 25 ; and ataxia, 19 ; hyperaesthesia, 22. [There is no mention of paralysis, or atrophy of muscles.]

Amoebiasis.—Cyst carriers were treated with either emetine bismuth iodide or emetine hydrochloride, and examined once after a week. Of 252 prisoners examined, 32, or 12·7 per cent., were positive, and 16 were treated. The results are given, but are naturally inconclusive.

Filariasis.—Of 203 examined, 29, or 14·3 per cent., harboured *F. bancrofti* larvae in their blood.

Leprosy.—Details are given of two cases in which a decided improvement followed intravenous treatment with Ol. chaulmoograe 750 parts, chloroform 250, and carbolic acid 10. One patient was bedridden and is now about doing light work.

Bilharziasis.—Two cases of the urinary form were treated with tartrate of antimony and are believed to be cured.

A. G. B.

MONTEL (M. L. R.). **Erythème toxique par le Stovarsol.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 630–631.

A lady who had been treated at Saigon with emetine for amoebic dysentery had some further symptoms at Paris, with the presence of cysts. She received daily for 8 days two tablets of stovarsol. On the 7th day she complained of malaise, nausea, and rushes of heat; on the 8th appeared a macular, morbilliform, very itchy eruption, with polyadenitis, pains in all the limbs and fever (39·5° C.); the next day the rash became general, the fingers and toes were swollen, the buccal mucosa red, and the conjunctiva congested; pruritus was intense. Thereafter she gradually improved. A month later she was normal and cysts were no longer found. The author observes that the erythema resembled closely that following arsenobenzol; the patient was very susceptible to drugs.

A. G. B.

SANARELLI (G.). **Sur la pathogénie du charbon dit "interne" ou "spontané."**—*Ann. Inst. Pasteur.* 1925. Mar. Vol. 39. No. 3. pp. 209–297. With 3 plates in colour. [127 refs.]

The argument of this paper is that internal or "spontaneous" anthrax is due, not, according to long-accepted belief, to direct germination of swallowed spores that have escaped gastric digestion, but to "haematogenous" infection. The author's experiments, made chiefly on young and adult guineapigs and rabbits, show that large quantities of non-sporing anthrax bacilli may be administered to these animals, either by mouth or anus, or by appendicular fistula, without harmful effect—the bacilli are killed in the intestine, just as they are, *in vitro*, by the gastric or by the intestinal juices. These animals will also resist considerable doses of sporing bacilli administered by the mouth, if the mucosa be not injured—the spores are killed in the same way by the digestive juices or by the *coli* bacilli. The animals will also resist considerable doses (not above 50,000 spores) of sporing bacilli if these be introduced into the lungs by the nasal route without abrading the skin or mucosa; in this case the spores are all phagocyted and, remaining dormant, gradually undergo digestion in the phagocytes or are excreted by the intestine. But if the animals when thus infested with a moderate dose (not above 50,000 spores) of sporing bacilli have their natural resistance weakened—by introduction into some viscus, or subcutaneously, or intravenâ, of arsenic, quinine, lactic acid, nucleinate of hyposulphite of soda, glucose, peptone, blood, milk, distilled water, or dead or living cultures of *coli* bacilli, or by exposure to heat (37° C.), or by a diet entirely free of water—the spores ingested by the phagocytes will be liberated and a general septicaemic anthrax will be the result. The surest method is to inject one of these spore-liberating solutions into the spleen 24 hours after introduction of the sublethal dose of sporing bacilli into the lungs. (A mortal dose of bacilli (100,000 spores) introduced into the lungs overcomes the pulmonary phagocytes, and sets up a general septicaemic anthrax, at once). It is, according to the author, from the infected blood that the lesions found, after death, in the alimentary canal originate—not from swallowed spores.

A. A.

BOEDEKER (H. A.). **"Etiology of Anthrax."** [Correspondence.]—*Kenya Med. Jl.* 1924. Oct. Vol. 1. No. 7. p. 215.

Continuing this correspondence [this *Bulletin*, Vol. 21, p. 912] Dr. Boedeker has seen malignant pustule in natives concerned in the hide trade at Nairobi, and among natives at Kisumu who rubbed infected mutton-fat on their bodies at a time when anthrax was raging among their cattle. He recalls also one case of internal anthrax, found in a native picked up dead; films from the mesenteric glands were positive.

A. G. B.

PAWAN (J. L.). **Locomotor Ataxia with Charcot's Joint Disease in a Negro.**—*Ann. Trop. Med. & Parasit.* 1924. Oct. 31. Vol. 18. No. 3. pp. 347–350. With 1 plate.

The patient was a negro of 58, born, bred and resident all his life in Trinidad. History of a penile chancre at 19, marriage 7 years later, and loss in early life of 9 out of 11 children. At 46 he began to suffer from "(1) periodic attacks of sharp shooting pains about his knees and legs with a tendency to fall when walking; (2) hot burning sensations about his body; (3) difficulty of micturition; (4) tenderness and pains about his knee-joints which gradually increased in size. The pains about his knees persisted for two years and the difficulty with micturition for six years. He has been impotent for the last eight years."

The knee-joint lesions seem to have been typical of Charcot's disease: they are described and figured in a good photograph. Knee and ankle jerk were absent. Inco-ordination of lower extremities, Argyll-Robertson pupil and Rombergism present. Feet brought down in walking with a stamp. The blood Wassermann 4 plus. The only complaint was the discomfort and inconvenience caused by the condition of the knee joints.

A. G. B.

RIDLEY (H. N.). **Poisoning by Bamboo Hairs.**—*Jl. Trop. Med. & Hyg.* 1924. Oct. 15. Vol. 27. No. 20. p. 278. [1 ref.]

Ridley refers to a report that in Malaya the ingestion of bamboo hairs with black sand or powdered glass produces a form of chronic dysentery causing ulceration of the stomach and intestines. Some cats were thus treated and died in a few days [symptoms not mentioned]. He describes the hairs, which are produced on the leaf sheaths of most kinds of bamboos, amongst which he cites *Oxytenanthera sinuata*, and two species each of Bambusia and Dendrocalamus. They are 1-2 mm. in length, very slender, sharply pointed at one end and easily detached. The hairs are administered in coffee or curry. [Similar information, also without case reports, is given in GIMLETTE'S "Malay Poisons and Charm Cures."]

A. G. B.

ROGERS (Leonard). **Alcohol in the Tropics.**—*Practitioner.* 1924. Oct. Vol. 113. No. 4. (No. 676). pp. 281–288.

Sir L. Rogers finds that the consumption of alcohol predisposes to heat stroke, as well as to hepatitis and liver abscess. The occurrence of liver abscess is almost invariably associated with irregular or intemperate habits (WARING), and its rarity in India in women and children is attributed to their abstention from the use of alcohol. The administration of alcohol in many of the most important tropical diseases is positively harmful and he does not know of any serious tropical affection in which its regular exhibition is of value. Though he is not aware of any definite evidence that drinking a very moderate amount of well-diluted alcohol after sunset at the evening meal has done any harm, he believes it would pay insurance companies to reduce premiums to abstainers living in the tropics. Norman CHEVERS and Edmund PARKES are cited against alcohol, though the former wrote: "Good food and beer and wine in great moderation are valid aids to efficient bodily and mental work in that climate [India]."

A. G. B.

SMITH (S.). **Diphtheria in Secunderabad.**—*Jl. Roy. Army Med. Corps.* 1924. Oct. Vol. 43. No. 4. pp. 282–288.

The object of this paper is to draw attention to a small series of cases of diphtheria—not exactly an outbreak, but something more than sporadic—in Secunderabad. The cases were not typical, and the Klebs-Loeffler bacillus was not always to be discovered, and even when it was found was not constantly in presence. He thinks it likely that similar anomalous and sporadic cases of the disease may occur in other stations on the plains of India where diphtheria is believed to be rare, and that they should be watched for.

A. A.

CHIADINI (Massimo). **L'amebiasi e la febbre maltese in Romagna.**—*Giorn. di Clin. Med.* 1924. Oct. 30. Vol. 5. No. 15. pp. 582–584.

During 1923 and 1924 several cases of amoebic dysentery were seen in the Civil Hospital of Cesena (Forlì). Four kilometres distant, in the Rio Marano district, ten more cases occurred, some in children, some in adults. Emetine in doses of 8-9 cgm. daily, together with rectal administration of quinine bi-hydrochloride, brought about rapid amelioration of symptoms. The courses never exceeded a total of 1 gm. of emetine.

Prior to 1915 undulant fever was not known or was overlooked in the Romagna. During recent years cases have occurred in Ravenna, Forlì, and in Bologna, and in 1923 the disease assumed an epidemic character. Thirty-one cases were seen by Professor GIUGNI in the environs of Lugo, 12 by TEDESCHI in Gatteo.

H. Harold Scott.

REYES (Carmelo). **Appendicitis among Filipinos.**—*Jl. Philippine Islands Med. Assoc.* 1925. Mar. Vol. 5. No. 3. pp. 75–83. [7 refs.]

The following table of admissions for appendicitis into the surgical wards of the Philippine General Hospital sufficiently explains the origin of this enquiry :—

Admissions for the last 5 years (1920-1924 inclusive).

1920	140
1921	190
1922	272
1923	484
1924*	529
	1,615

* November and December excluded.

The natural question follows : Is this a real or an apparent increase, and if real, is it to be attributed to a change in habits of the Filipinos ? The study is based on 2,150 Filipino patients, more than 75 per cent. of whom had operations. Data are given of age, sex and occupation [which would be of value if other relevant data were supplied]. Parasites were found in 18 per cent. of the stools and 38 per cent. of those appendices that were microscopically examined—a striking difference, explained, however, by the statement, " routine examination of the stools was not done." Information is given of the state and anatomical disposition of the appendix at operation and a wealth of detail about the symptoms. No case was seen in a child under five, which the author suggests is due to the relative immunity of Filipino children to Oxyuris. Comparing the figures for parasites with those of American statistics (CECIL and BULKLEY) the author finds that, whereas in these Oxyuris was present in 84 per cent., and Trichuris in 13, in those the Trichuris figures were 42 per cent., and the Oxyuris only 4 ; Trichuris+Ascaris account for another 21 per cent., and Ascaris alone for 11 per cent. The last two parasites are looked upon as " no mean contributing causes in the production of appendicitis." The author considers that the increase in appendicitis is both real and apparent. Increased meat consumption among Filipinos may have been contributory to the increase, but the information on this head is meagre. It is considered significant that the occupation table is headed by students and clerks, because they have adopted American methods of living and eating, including the bolting of food [but we are not told what proportion of hospital admissions these classes formed].

A. G. B.

i. SITSEN (A. E.). **Over Appendicitis in Indië.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 907–912. [3 refs.]

ii. VAN DER GUGTEN (F. E.). **Betreffende de frequentie der appendicitis.**—*Ibid.* pp. 913-914.

iii. LICHTENSTEIN (A.). **Appendicitis in Indië.**—*Ibid.* pp. 934–939. [2 refs.]

i. Sitsen emphasizes the necessity of producing numerical data when discussing the prevalence of appendicitis in the tropics. The expression " rare " is subject to various interpretation. The majority of cases operated on certainly occur in Europeans. Concerning Chinese the material is too limited to allow any conclusions. The author, a pathologist, examined five appendices obtained by operation on natives; in two cases there was no inflammation, in one an inflammation of the wall of the caecum, affecting the appendix also; in the other two cases there existed a typical chronic appendicitis. Both cases concerned natives of somewhat higher social standing, following more or less the European habits of life. This supports the author in his opinion that the different prevalence of this disease is at least partly caused by habits of life and nutrition.

Obliteration of the appendix, considered as a sequel of chronic inflammation, is found in 20-25 per cent. of post-mortems in Europe; the author found it in 1-5 per cent. of post-mortems of natives in Java.

ii. Van der Gugten maintains that appendicitis is not rare. He performed 40 appendectomies within 8 months, but does not state the race of his patients.

iii. Lichtenstein saw in four years approximately 2,000 clinical patients at Weltevreden, among whom there were 5 cases of appendicitis (4 Europeans, 1 Javanese). Other diseases also differ in prevalence in comparison with European statistics. He emphasizes the necessity of differential diagnosis between chronic appendicitis and amoebiasis of the caecum. He proposes that the Medical Section of the Scientific Congress in the D.E.I. in 1926 should deal with the subject of appendicitis in the tropics.

W. J. Bais.

CORREIA (Alberto Carlos Germano da Silva). **A meningite cèrebro-espinal e as suas relações noso-meteóricas com alguns climas angolenses.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 511-536. With 5 charts. [1 ref.]

The author states that there are certain parts of Angola where the "meningitic syndrome, which may or may not be due to the meningococcus, is endemic." Two main foci are mentioned; one in the north-west, comprising Holo, Ginga and Songo, and extending to Melange and Pango Andongo, another in the south-west, the district of Mossamedes, extending to Lubango, Chibia and outlying villages. Certain points such as altitude, temperature and humidity are discussed, but, although the disease is spoken of as epidemic meningitis, and records are attempted to show the prevalence for over 50 years, very rarely does the number of cases exceed one a month. The greatest in any one year occurred in Mossamedes, where in 1912 there were 5 deaths [according to the Table, but 22 according to the text] amongst 44 cases.

H. Harold Scott.

PRATES (M. Maximo). **Ensáios sobre a etiologia dos abcesso quentes consecutivos ás injecções de quinina.** [The Etiology of Acute Abscesses following Quinine Injections.]—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 413–418.

In view of the large numbers of patients developing abscesses after injections of quinine the author asked his colleagues to allow him to collect aseptically some of the contents of such abscesses. He wished to determine whether the abscess formation was due to infected material used for injection, or to be ascribed to faulty technique on the part of the operator, or, lastly, whether the abscesses were aseptic and chemotactic, as produced by turpentine injection. He found that the drug itself was sterile, and, further, that it had to some degree a bactericidal action. The chemotactic action of the quinine did not account for the formation of pus, and he concludes that a large proportion of these abscesses are due to insufficient sterilization when the injections are made.

H. Harold Scott.

i. Zeiss (Heinz). **Das Reichsinstitut für Epidemiologie und Mikrobiologie für den Südosten Russlands in Saratow an der Wolga.** [The Imperial Institute of Epidemiology and Microbiology for South-East Russia at Saratov on the Volga.]—*Muench. Med. Woch.* 1924. Nov. 21. Vol. 71. No. 47. pp. 1648-1649.

ii. Figueira (J.). **Quelques cas d'ichtyoxisme.**—*Revista Méd. de Angola.* (No. especial 1° Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessao de encerramento.) 1923. Aug. No. 4. pp. 119–122.

iii. Adelino (Antonio Correia). **Ambulâncias de Campanha e dos postos do interior.**—*Ibid.* (No. especial 1° Congresso de Med. Trop. da Africa Ocidental. Vol. 1. 1a. Sessão.) 1923. Aug. No. 4. pp. 239-246.

iv. Nichols (Henry J.). **The Needs of Publication in Tropical Medicine.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 951–957. [United Fruit Company, Boston, Mass.]

i. An account of this Institute at Saratov, a tropical research institute for south-east Russia. It is chiefly concerned at present with plague.

ii. Doubtful cases of fish-poisoning from eating putrid fish—the fish happening to be *Trachinus vipera.*

iii. A paper dealing with travelling ambulances and giving in detail the author's view of the best equipment and its stowage—the instruments, dressings and drugs it is advisable to provide.

iv. The records of the English-speaking countries are here considered. High and much appreciated praise is given to this *Bulletin.*

A. G. B.

REVIEWS AND NOTICES.

WOLFF (J. W.). **Onderzoekingen betreffende Cultuur en Serologie der Leptospirae.** [Researches on the Cultivation and Serology of the Leptospirae.]—*Academisch Proefschrift.* Amsterdam. 1924. 8°; pp. 1–74, with 1 plate (5 figs) & 15 tables [only 10 numbered]. [84 refs.] Abstracted in German in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Mar. 1. Vol. 29. No. 3., pp. 111–128. With 5 figs. [39 refs.]

The author of this Dutch dissertation for the M.D. degree has made a careful study of three different strains of *Leptospira*: namely, a strain of *L. icterohaemorrhagiae* from a human case of Weil's disease (Berlin), a strain (really several, but apparently all identical) from Amsterdam rats, and a strain isolated by BAERMANN in Sumatra from the blood of a native with a recurrent fever unaccompanied by jaundice [*cf.* BAERMANN, *Geneesk. Tijdschr. v. Nederl.-Indië*, 1923, lxiii, 885. This *Bulletin*, Vol. 21, p. 260].

According to the author, all these organisms can best be cultivated aerobically—in small tubes (2 cc.), without a layer of paraffin—in the medium devised by VERVOORT (1923). This consists of a solution of 0·1 per cent. peptone and 0·05 per cent. NaCl in tap-water, buffered by the addition of 5-10 per cent. of a phosphate solution and adjusted so that it finally has a pH=7·2. The further addition of 10 per cent. of inactivated rabbit serum (or 1 drop per cc. of whole rabbit blood) appeared to be advantageous, inasmuch as the spirochaetes lived somewhat longer in this solution.

As regards cultural requirements, morphology, and pathogenicity for the guineapig, the three strains studied appeared to be identical. Serologically, however, a curious distinction between them was manifested. The Weil-strain and the Baermann-strain showed no affinities to one another: Baermann Leptospirae were neither lysed nor agglutinated by Weil antiserum, nor were Weil Leptospirae by Baermann antiserum. On the other hand, both antisera produced lysis of two rat-strains up to the titre-limit (1 : 2,000), whilst rat-strain antisera had a similar effect upon both the Weil and the Baermann spirochaetes. "Serological identity between two Leptospira strains is no proof of the complete identity of these strains. They may, none the less, behave differently towards a third strain." It should be added that the author diluted his sera with culture medium, since physiological salt-solution itself affects the organisms harmfully, and therefore cannot be used as a diluent; and he attaches more importance to lysis—as a serological test—than to agglutination.

Though the thesis contains nothing strikingly novel, it yet has some acute annotations and discussions of various other details, and is worth reading in the original by anyone interested in the subjects with which it deals. It is well written and printed, and adequately documented with references to the works of others; but unhappily the name of the foremost worker on the pathogenic Leptospirae—Prof. Ryokichi INADA—is consistently misspelled throughout.

Clifford Dobell.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No 9

KALA AZAR.

CHRISTOPHERS (S. R.), SHORTT (H. E.), & BARRAUD (P. J.). **The Development of the Parasite of Indian Kala-Azar in the Sandfly** *Phlebotomus argentipes* **Annandale and Brunetti.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 605-607.

The authors, working in Assam, are able to confirm the observation of KNOWLES, NAPIER and SMITH (*ante*, p. 193) that *L. donovani* develops into flagellates and multiplies in the intestine of *Phlebotomus argentipes* fed on the peripheral blood of kala azar cases. Only wild flies were used, and 13 which had fed on suitable cases were examined at intervals of 1 to 5 days after feeding. In 5 of these flagellates were found. In one fly 40–50 flagellates occurred in the mid gut, in another they were very numerous. Seventy-four females and 23 males were dissected as controls with negative results. The authors note that during November and December search of houses in which kala azar cases had recently occurred in Assam did not reveal any sand flies, which were found almost exclusively in stables and without any definite relation to the incidence of the disease.

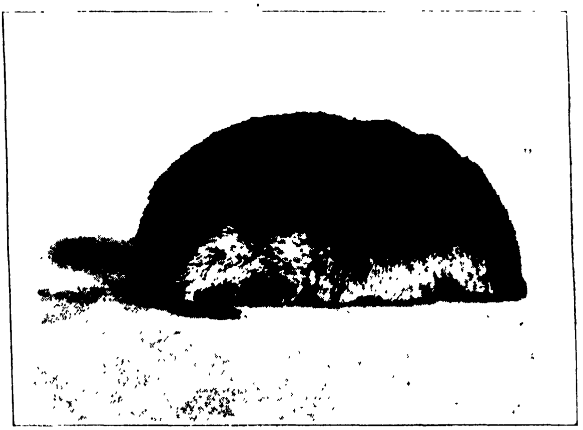
C. M. Wenyon.

MELENEY (Henry Edmund). **The Histopathology of Kala-Azar in the Hamster, Monkey, and Man.**—*Amer. Jl. Path.* 1925. Mar. Vol. 1. No. 2. (Whole No. 2.) pp. 147-167. With 6 plates. [16 refs.]

——. **Kala-Azar in China with Special Reference to its Histopathology in Experimentally Infected Hamsters.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1925. May. Vol. 18. No. 7. pp. 33-40. With 6 text figs. [13 refs.]

It has already been reported that the hamster (*Cricetulus griseus*) of N. China is very readily infected with *Leishmania donovani* (this *Bulletin*, Vol. 21, p. 720). The infection progresses in intensity over long periods, and in spite of this the animal often remains in what appears to be perfect health. In one case an animal apparently healthy was killed on the 455th day and was found to be very heavily infected. Macroscopically at post mortem examination the only pathological sign is the enlargement of the spleen. In the normal animal it is 0·15 to 0·3 per cent. of the total body weight, while in the animal referred to above it weighed 1·0 gm. and was 3·1 per cent. of the body weight. Usually the liver shows no change, but exceptionally it may be greatly enlarged.

Microscopically it was found that there was a specific tissue reaction in the form of endothelial proliferation forming masses of " clasmatocytes " heavily parasitized. The chief organs affected were the liver, spleen lymph nodes and bone marrow. In advanced infections the parasites also attack the parenchymatous cells of the liver and adrenal cortex, extensive degeneration of the liver occurs, and infected " clasmatocytes " appear in practically every organ and tissue, the stroma of the intestinal mucosa being the site of massive accumulations of these cells. In spite of the heavy infections of the intestinal wall the epithelium remained intact, so that the damaged epithelium observed by PERRY (this *Bulletin*, Vol. 20, p. 95) in similar infections in a human case is probably a post mortem change. In two monkeys infection produced a similar picture of endothelial proliferation as also in human cases. The paper, which is a most important contribution to the pathology of kala azar, is illustrated by a photograph of the hamster (reproduced here) and microphotographs and coloured drawings of sections of various organs showing the characteristic tissue reaction.



The Striped Hamster, *Cricetulus griseus* M. Edw., from Peking, China. About one-half life size. The adult measures about 8 cm. in length and weighs about 30 gm.

[Reproduced by permission from the *Transactions of the Royal Society of Tropical Medicine and Hygiene*, Vol. 18 No. 8.]

The second paper is a summary of the matter discussed in the first.

C. M. W.

NAPIER (L. EVERARD). **A Comparative Study of the Environment associated with Kala-Azar Prevalence in Calcutta.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 755–772. With 3 maps and 3 figs. on 1 plate. [2 refs.]

The cases of kala azar treated at the School of Tropical Medicine, Calcutta, during 18 months up to March, 1923, were investigated from the point of view of the source of infection. Those which had come to Calcutta for treatment were fairly uniformly distributed about the town, but those which had evidently contracted the disease in Calcutta itself were concentrated in one area, while there was complete absence of the disease from another area. It was previously shown that this concentration could not be due altogether to racial or caste differences in the population, and a careful survey of the two areas was made to discover if possible any features which might account for the distribution. It was found that the disease was definitely associated with vegetation in close propinquity to the dwellings, earth unprotected by cement or paving-stones in and around the dwellings, and ground floor residence. In addition, insanitary conditions, especially with reference to fowls and ducks in and about the houses, may possibly have to be added, while in the endemic area itself masonry houses in contradistinction to those of bamboo or khola seemed to have a bearing on the incidence of the disease. In both areas ample opportunity of bed bug and mosquito transmission occur, while lack of sanitation alone cannot be the only factor, as this also occurs in areas where the disease is not found. The ground floor factor suggests an insect with a small range of flight, such as the Culicoides or the sand fly. Vegetation, especially its decaying and moist debris, is suggestive of the former, though possibly this is also necessary for the male sand fly. Uncovered earth, masonry and nitrogenous matter supplied by domestic animals makes the balance of evidence appear to be slightly in favour of the sand fly.

C. M. W.

CUNNINGHAM (J.) & PUNDIT (S. R.). **A New Endemic Focus of Kala-Azar in Southern India.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 743–754. With 8 figs. on 1 plate & 3 maps in text. [2 refs.]

The paper records a new endemic focus of kala azar in the Madras Presidency. It occurs in the Tinnevelly District about 20 miles from Cape Comorin. There is evidence that this focus is only a part of a more extensive endemic area extending along this part of the littoral. Of 122 suspected cases examined 56 were definitely proved to be kala azar, which corresponds with the disease as it is observed in other endemic areas. A feature which may be of importance from the point of view of etiology is that the disease was limited entirely to the Mahomedans, although the Hindus live in close propinquity with them. Enquiry has shown that the local inhabitants have recognised the disease since 1884 and have noted 2 epidemic phases in 1884 and 1909.

C. M. W.

MAITRA (Jogendranath). **Is Kala-Azar Contagious?**—*Calcutta Med. Jl.* 1925. Feb. Vol. 20. No. 8. pp. 315–317. With 1 plate.

As an argument in favour of the possibility of contagion in kala azar a family is mentioned in which a woman suffering from kala azar came with her husband to Calcutta for treatment. She was cured, after which a healthy child was born. The father was then found to be suffering from the disease and three months later the infant also. Both the father and the child were cured. The author states that he knows of other families in which various members have contracted the disease.

C. M. W.

MAGGIORE (Salvatore). **Contributo allo studio etio-patogenetico delle infezioni da Leishmania.**—*Pediatria.* 1925. Feb. 15. Vol. 33. No. 4. pp. 169–172. [5 refs.]

A series of cutaneous and subcutaneous inoculations was made in human beings with *Leishmania donovani*, taken directly from the bone marrow of a case of kala azar, with cultures of *L. donovani* and with cultures of *L. tropica*. In no case did infection result. In a second series four individuals were inoculated with *L. donovani* directly from a case of kala azar, three with cultures of *L. donovani* and three with cultures of *L. tropica*. In none of these cases did any infection take place. These results are contrasted with the well-known fact that direct inoculation of *L. tropica* from a human case of oriental sore into the skin of a healthy human being reproduces the disease, and that the inoculation of *L. donovani* into the skin of animals may give rise to local lesions. It is maintained that the negative results obtained offer another proof of the biological difference between *L. donovani* and *L. tropica*.

C. M. W.

JESSNER (Max) & AMSTER (Siegfried). **Leishmaniavakzine—Leishmaniinreaktion.**—*Deut. Med. Woch.* 1925. May 8. Vol. 51. No. 19. p. 784.

A strain of *Leishmania tropica* was maintained in dogs and in culture. A blood-free vaccine was prepared from the cultural forms, and it was found that the injection of the diluted vaccine (1 in 10) into the skin of dogs suffering from oriental sore produced a marked reaction in the form of a red swelling which persisted for 48 hours. In healthy dogs and those recovered from infection no reaction, or at most a very transitory one, occurred. When it was tested on a human case of the disease an even more definite reaction occurred, while controls showed only a slight reddening of the skin. The use of the test as an aid to diagnosis is advocated.

C. M. W.

GANGULI (P.). **The Value of the Aldehyde Test in the Diagnosis of Kala-Azar.**—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. pp. 204–206.

As improved methods of diagnosis of kala azar are becoming more general, long-standing cases in which the aldehyde test gives a+++ reaction are less frequently seen. It is becoming increasingly important to determine the value of the aldehyde test as applied to early cases when the reaction is + or ++. Such results have been obtained in 5 cases with chronic skin disease, 8 cases of convalescent pneumonia and 3 cases of chronic malaria, and, as previously noted by the author (this *Bulletin*, Vol 21, p. 715), in a mild case of splenomedullary leukaemia. It is noted that the reaction depends on the gradual increase of the euglobulin content of the blood associated with the development of antibodies which are intimately bound up with this substance. From the results obtained it follows that the value of the aldehyde test is purely a negative one. If a case of suspected kala azar of over 5 months standing gives a negative reaction it can safely be assumed that it is not one of this disease.

C. M. W.

NICOLLE (Charles). **Chronique du kala azar en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 136–139. [2 refs.]

This is a note relating to the incidence of infantile kala azar and other details connected with the disease in Tunisia. To the list of 62 cases previously recorded 5 new ones are now added. Of these cases 37 were in children between 1 and 3 years of age, the eldest being 9½. Interesting information regarding the maintenance of cultures of the organism are given. Three strains were isolated from human cases in September, 1910, February, 1912, and August, 1918. Up to the end of 1924 they had been subcultured 395, 345 and 163 times. Two strains from dogs isolated in December, 1911, and February, 1913, have been subcultured 345 and 334 times. Three strains from oriental sores isolated November, 1909, November, 1919, and December, 1919, have been subcultured 384, 132 and 130 times. Two strains of the leptomonas which can be cultivated from the blood of geckos were isolated in April–May, 1917, and have passed through 188 subcultures and two strains isolated in October, 1919, have passed through 134. A trypanosome of the toad isolated in May, 1917, has been subcultured 193 times.

C. M. W.

D'OELSNITZ, DAUMAS, LIOTARD & PUECH. **Quatre cas de kala-azar d'origine française. Résultats favorables du traitement par les injections intraveineuses d'émétique de soude.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Feb. 26. Year 41. 3rd Ser. Vol. 49. No. 7. pp. 255–267. With 5 text figs.

The paper gives an account of 4 cases of infantile kala azar which came under observation at the hospital in Nice, in the South of France. Taking into account the cases previously recorded from this littoral, it appears evident that, though the disease is not so common as in other parts of the Mediterranean area, cases will be repeatedly encountered. It is probably more common than the recorded cases indicate as it is often not suspected. The 4 cases noted in this paper were treated with sodium antimonyl tartrate. Three recovered and one died. Parasites were discovered in the peripheral blood of one of the cases.

C. M. W.

SHORTT (H. E.) & BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XIII. Further Observation on Dermal Leishmanoid.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 463–466. With 2 plates. [2 refs.]

Three years ago BRAHMACHARI (this *Bulletin*, Vol. 19, p. 551) described a peculiar skin eruption which occurred in a man who had been treated for kala azar. The eruption was shown to be due to infection of the skin by leishmania. In the paper now under review a second case of the same kind is described. The patient was treated for kala azar with injections of sodium antimonyl tartrate. A relapse occurred in 6 months, and another course of the same treatment was given. Nine months after this course a peculiar skin eruption was noticed. It appeared first as nodules over the ear but extended to other parts of the body. Besides the nodules there occurred a number of slightly raised brown patches. Leishmania were present in the nodules, but none could be cultivated from the peripheral blood. The patient was given a course of urea stibamine, which caused some subsidence of the skin eruption. Three months later he had still further improved, but a few nodules and patches were present. It appeared that the eruption was due to infection of the skin with leishmania rendered somewhat resistant to antimony by previous treatment. Histological examination of a nodule showed that in the cutis vera there occurred a deep layer of cells which infiltrated the usual open connective tissue. In these cells, which appeared to be those ultimately differentiated as endothelial and stroma cells, leishmania occurred. The paper is illustrated by an excellent coloured plate of the skin lesions and microphotographs of sections of a nodule.

C. M. W.

ACUNA et al. [**Kala-Azar in Children.**]—*Prensa Méd.* Buenos Aires. 1924. Nov. 30. Vol. 11. p. 585. [Summarized in *Jl. Amer. Med. Assoc.* 1925. Jan. 17. Vol. 84. No. 3. p. 237.]

This summary states that the authors have seen a case of kala azar in a child under 3 years of age in the Argentine. The child had been ill for 6 months, and necropsy revealed parasites swarming in the blood-producing organs. The note continues that none had been found in the stools, but puncture of the spleen had cleared up the diagnosis. [The statement regarding the absence of parasites from the stools suggests a lack of knowledge regarding the methods of diagnosis of kala azar. If this case is authentic it is the first autochthonous one from S. America.]

C. M. W.

INNES (Flora R.). **Three Unusual Cases of Kala-Azar.**—*Jl. Assoc. Med. Women in India.* 1925. Feb. Vol. 13. No. 1. pp. 40–43.

Three cases which appeared to be kala azar from the positive formaldehyde test and the response to tartar emetic treatment, showed peculiar symptoms. One case presented the picture of typical acute nephritis, one a history of the same condition followed six months later by sub-acute nephritis, and one tachycardia, oedema, and suppression of urine. The suggestion was made by Dr. MUIR that all 3 cases were probably examples of hypo-adrenia due to concentration of the leishmania in the adrenals.

C. M. W.

LEMIERRE (A.), LEON-KINDBERG (M.) & BERNARD (Etienne). **Kala-azar tunisien à évolution mortelle chez une adulte.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Apr. 9. Year 41. 3rd Ser. Vol. 49. No. 13. pp. 537–546. With 1 text fig. [9 refs.]

The paper describes a case of kala azar in a woman twenty-six years of age. It is of interest that the disease was contracted at Goulette, in Tunisia, where children alone have hitherto been found infected, and where the first case of Mediterranean kala azar was discovered by CATHOERE in 1904. The disease was of a particularly resistant type, and did not respond to injections of stibenyl, the patient dying in France eight months after the onset of symptoms. During the course of the illness torsion of the pedicle of the spleen, necessitating splenectomy, occurred. It was not possible to obtain any information regarding the origin of the infection. The patient had lived in well appointed military quarters and had never been associated with dogs.

C. M. W.

NAPIER (L. E.). **A Preliminary Note on the Successful Treatment of Kala-Azar with "Stibamine Glucoside."**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 24–26. [4 refs.]

Owing to the good results following the use of von Heyden 471 (meta-chlor-para-acetyl-amino-phenyl stibiate of sodium) in the treatment of kala azar in Calcutta, the drug has been adopted as the standard treatment in the wards of the Carmichael Hospital for Tropical Diseases. In addition treatment has been carried out with " stibamine glucoside " prepared by Dr. HENRY, of the Wellcome Research Laboratories. Ten cases have been treated with this drug, and it is quite obvious that it is far superior to the antimony tartrates and that it compares very favourably with von Heyden 471 and urea stibamine. The compound is easily soluble in distilled water to a 4 per cent. solution. It was injected intravenously in doses of 0·05 to 0·3 gm. After some trials it was found that an initial dose of 0·1 gm. and a maximum dose of 0·2 gm. for a patient weighing over 50 lb. was satisfactory, and it seems probable that this will be a good system to adopt. The injections were given as a rule on alternate days. Of the 10 cases treated, 9 have recovered. One patient died, but he was admitted to hospital in a dying condition; though some improvement occurred, death took place suddenly from collapse 48 hours after the fifth injection.

C. M. W.

BRAHMACHARI (Upendra Nath) & MAITY (Bibhuty Bhusan). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part XIV. Observations on a Series of Cases of Kala-Azar treated with Urea Stibamine during a Course of 32 Hours to 7 days.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 735–740.

The authors have collected information regarding 27 cases of kala azar (18 of their own and 9 of other observers) which were treated successfully with urea stibamine for 7 days or less. In all these cases parasites disappeared from the organs and clinical recovery followed. In a few cases the procedure of giving multiple injections on one day so as to maintain a constant high concentration of urea stibamine in the blood has led to a remarkable shortening of the period required for sterilization of the peripheral blood. No untoward result followed this method of medication. It is pointed out that the mechanism of action of antimonial preparations on Leishmania is a very complicated one. Urea stibamine is generally admitted to rid the patient of the parasites in a much shorter time than potassium or sodium antimonyl tartrate, but even with urea stibamine the time required to bring about this result varies with individual patients. Some cases are much more quickly amenable to treatment than others. The mechanism of this variability is a subject worthy of investigation. The period of observation of the cases recorded is as a rule short, but 4 of them have remained healthy for 3, 5, 5 and 5½ months respectively.

C. M. W.

GREIG (E. D. W.) & KUNDU (S.). **Observations on the Quantity of Urea Stibamine, "471" (von Heyden) and Stibamine Glucoside required for the Complete Treatment of a Case of Kala-Azar.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 679–688. With 4 figs. on 2 plates. [3 refs.]

The object of the investigation, the results of which are detailed in this paper, was to determine, as nearly as possible the quantity of urea stibamine, "471" (von Heyden) and stibamine glucoside required to destroy completely the parasite in cases of kala azar. Most of the 68 cases of which the tests were made had proved resistant to tartar emetic. The drugs were administered intravenously on alternate days in the following doses :—Urea stibamine (adults) 0·20 to 0·25gm. (children) 0·1 to 0·20 gm. ; "471" (adults) 0·2 to 0·3 gm. ; (children, one case only) 0.05 to 0.20 gm. ; stibamine glucoside (adults) 0·1 to 0·3 gm. ; (children) 0·05 to 0.10 gm. The strengths of solutions used in percentages were 2, 1 to 3, and 1 to 3 respectively. The progress of the cure was controlled by spleen or liver puncture and culture from the material obtained. Of 52 cases treated with urea stibamine, one proved resistant and is not included. Similarly, of 14 cases treated with "471" three are omitted, one having died during treatment, one not having completed the course and one proving resistant. With stibamine glucoside only two cases were treated. All the cases, 64 in number, on which the calculations are based were cured. The quantities of urea stibamine, "471" and stibamine glucoside required to complete the treatment of a case are 4·2 gm., 3·49 and 1·85 to 2·05 gm. The mean sterilizing quantities of the three drugs in grammes per kilogram of body weight are 0·053, 0·060 and 0·042 respectively. It is concluded that the results appear to indicate that the three drugs are of the same order of efficiency in the treatment of kala azar.

C. M. W.

GREIG (E. D. W.) & KUNDU (S.). **Observations on Two Cases of Kala-Azar resistant to Treatment.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 689–694. [2 refs.]

During the course of the investigations described in the above paper two cases of kala azar were encountered which proved resistant to urea stibamine and "471." Both had resisted previous treatment with tartar emetic. One of the cases had received 0·203 gm. of urea stibamine per kilogram of body weight and the other 0·116 gm., yet parasites still persisted in spite of the fact that increase in body weight had taken place.

C. M. W.

KAPUR (N. C.). **Observations on the Treatment of Kala-Azar with Urea Stibamine in the Medical Out-Patient Department of the Medical College Hospital, Calcutta.**—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. pp. 206–210.

The paper describes in tabular form the result of treatment of 50 cases of kala azar with urea stibamine. Twenty-five of the cases had proved resistant to previous treatment with tartar emetic. All the cases recovered. The following observations are made :—

(1) The course of treatment necessary, when compared with the minimum of 3 months for tartar emetic, is remarkably short. In some cases cure followed a 7-day course of treatment.

(2) The average number of injections is 7 to 10, whereas with tartar emetic as many as 30 or more are frequently required.

(3) The beneficial effects in cases resistant to antimony tartrate were clearly shown.

(4) Jaundice and albuminaria are no contraindications to administration of urea stibamine if small doses, gradually increased, are given.

(5) There were no signs of intolerance even in cases which were intolerant of tartar emetic.

(6) Splenic enlargement, fever and leucopenia rapidly disappeared.

C. M. W.

IZAR (Guido). **Sur le traitement de la leishmaniose interne.**—*Presse Méd.* 1925. Mar. 7. Vol. 33. No. 19. p. 303.

Two cases of infantile kala azar which proved resistant to tartar emetic were treated by intravenous injections of the sulphate of sanguinarine, the alkaloid of *Sanguinaria canadensis* and the hydrochloride of isoamylhydrocuprein. It is stated that after 3 months a definite cure resulted. The author has been unable to continue his observations, but suggests that instead of injecting the drugs separately a mixture could be prepared containing 0·4 gm. of the first drug and 4 gm. of the second in 100 cc. of distilled water. The proposed dose is 0·25 cc. increasing by 0·25 cc. up to 2 cc., injections to be given twice a week.

C. M. W.

DE SOUZA (Salazar). **La splénectomie dans le kala-azar infantile.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 409–417.

The paper discusses the value of splenectomy in the treatment of kala azar. In the author's experience of this operation in other conditions, such as Banti's disease, the immediate result has been an increase in the haemoglobin of the blood and a leucocytosis. He has already expressed the opinion that the spleen, possibly by virtue of a hormone, exercises a controlling influence on the amount of haemoglobin in the blood. As a result of these observations he was led to practice splenectomy in cases of infantile kala azar in Portugal, but the reports of the good results from Italy and elsewhere following tartar emetic or stibenyl medication led him to abandon the operation in favour of simple drug treatment. This change, however, did not lead to any improvement, so much so that he has again adopted splenectomy with the modification of administering tartar emetic or stibenyl in certain cases. The figures are as follows :—Eight cases were treated with intravenous or intramuscular tartar emetic alone. Of these five died of the disease, one was cured, one abandoned the treatment, and one did not respond, the disease being considerably aggravated. Seven cases were treated with stibenyl alone. Six died and in one the condition was aggravated. Fourteen cases were treated by splenectomy alone. Of these five died, two from the shock of the operation and three from the disease itself, though in these three cases the haemoglobin had increased in amount. Of the nine cases which recovered four were absolutely cured, four were clinically cured, and one died of an enteritis which appeared to have no connection with the previous condition. Of the eight cases regarded as cured, one died a year after the operation from influenza and nephritis, another more than a year after from typhoid fever, and another from pulmonary tuberculosis. These deaths, the author states, have no connection with the operation or its results. Of cases treated by splenectomy followed by tartar emetic or stibenyl injections, there were six. Of these, three were absolutely cured, while three died, one from tubercular meningitis, one from pleurisy and pneumonia, and one from shock of the operation.

As a result of these experiences in the treatment of infantile kala azar, the author advises splenectomy with the object of increasing the haemoglobin, followed by an injection of tartar emetic if the disease still progresses.

C. M. W.

NOGUCHI (Hideyo) & LINDENBERG (Adolph). **The Isolation and Maintenance of Leishmania on the Medium Employed for the Cultivation of Organisms of the Leptospira Group of Spirochetes.**—*Amer. Jl. Trop. Med.* 1925. Jan. Vol. 5. No. 1. pp. 63–67. With 1 plate. [3 refs.]

KLIGLER recently noted (this *Bulletin*, Vol. 21, p. 726) that NOGUCHI's medium used for the cultivation of leptospira was very suitable for the growth of *Leishmania tropica*, which often remained viable in a tube for at least 6 months. It was not clear that this medium would be suitable for the primary isolation of cultures from a sore. The authors of the paper under review have had an opportunity of testing this point and have found that it is highly advantageous for the isolation and maintenance of *L. tropica*.

The medium, which remains stable at ice-box temperature, is prepared as follows:—

	Parts.
0·9 per cent. saline	800
Fresh rabbit serum	100
2 per cent. nutrient agar (pH 7·2)	100
Rabbit haemoglobin (made by taking 1 part of defibrinated rabbit blood with 3 parts of distilled water) ...	10–20

C. M. W.

NOGUCHI (Hideyo). **Action of Certain Biological, Chemical, and Physical Agents upon Cultures of Leishmania; some Observations on Plant and Insect Herpetomonads.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 455–478. With 4 plates. [21 refs.] [United Fruit Company, Boston, Mass.]

Taking advantage of the ready growth of *Leishmania tropica* and other species in the medium noted in the above review, the author has carried out a series of experiments with the cultures. It was found that the growth of flagellates was limited to the superficial layers and forms a scum-like colony 2–4 mm. in thickness. The scum is practically a pure mass of organisms. It can be removed and will reform in the course of another week. This process of removal can be repeated for several months till the medium is exhausted.

Serological tests were made with *L. donovani, L. infantum, L. tropica* and *L. brasiliensis.* Rabbits were inoculated intravenously on four successive occasions at 5 to 7 day intervals with rich living cultures, and their sera were tested against the flagellates for agglutinins. Both the *L. donovani* and *L. infantum* sera agglutinated both *L. donovani* and *L. infantum* but not *L. tropica* nor *L. brasiliensis.* Similarly, the sera of the last two parasites had no action on the first two. Furthermore, the *L. tropica* sera agglutinated only *L. tropica* and the *L. brasiliensis* serum only *L. brasiliensis.* Serum diluted 1 : 10 caused prompt and powerful agglutination, while that diluted 1 : 100 was moderately active. The author concludes that the agglutination test permits the separation of at least three species of Leishmania. If immune serum is added to the medium to a strength of 10 per cent. the homologous organism grows in isolated colonies instead of in the usual scum.

It was found that all strains require oxygen for their growth, which does not take place in atmospheres of hydrogen, nitrogen, or carbon dioxide. As regards the reaction of the medium, good growth occurs within the range pH 5·08 to pH 7·21.

Certain phytotoxins and plant toxalbumins kill the flagellates. Saponin in a dilution of 1 : 10,000 killed them without dissolution. Ricin caused immobilization and agglutination in dilutions of 1 : 100 but abrin had no action. Animal poisons are also active. The venom of the Indian cobra affected the flagellates in 1 : 2,000 dilution in 0·9 per cent. saline, while a dilution of 1 : 20,000 killed them if a small amount of lecithin was added. The venoms of a number of other snakes were found to be quite inactive, but those of Lachesis and Ancistrodon became active in the presence of lecithin. Tartar emetic and salvarsan had no marked action on the flagellates. Contact of the drugs with fresh animal tissue did not yield a more toxic product. The photodynamic properties of certain fluorescent dyes was also tested. It was found that in certain dilutions these dyes had no action on the flagellates, unless actinic rays were present, when they became remarkably germicidal. Neutroflavine failed to kill the flagellates, as well as various spirochaetes, in dilution greater than 1 : 50,000, but did so in dilution of 1 : 10,000,000 if actinic rays were acting at the same time.

The flagellates of plants (*Asclepias curassavica* and *Eurphorbia brasiliensis*) of Tela, Honduras, as well as those from a plant (*Asclepias syriaca*) of New York, and from a bug (*Oncopeltus cingulifer*) off *A. curassavica* were studied. Cultures were not obtained, but it was found that none of the leishmania sera had any action on the flagellates as they occurred in the latex of the plants or in the intestinal contents of the bug.

The paper, which contains a mass of details, only some of which have been noted in this review, is well illustrated with coloured plates showing the character of the growth of the various species of Leishmania in test tubes and the changes brought about by the addition of sera, the characters of the cultural forms of the organisms, the flagellates of plants and the plants themselves, together with the bug mentioned above.

C. M. W.

SCHULZ (Martin). **Die Kernteilung von** *Leptomonas fasciculata* **nebst einem Vergleich mit der Kernteilung bei** *Leishmania donovani.* [Nuclear Division of *L. fasciculata* and its Comparison with the same Process in *L. donovani.*—*Arch. f. Protistenk.* 1924. Nov. 5. Vol. 49. No. 2. pp. 216–236. With 1 plate. [47 refs.]

The author has studied the nuclear division of *Leptomonas fasciculata* (of *Culex pipiens* and *Theobaldia annulata*) and *Leishmania donovani* during multiplication in cultures on blood agar plates. In both cases the central karyosome elongates, and it is found that it is actually a spindle. In the case of *L. fasciculata* three chromatin granules appear in the spindle. They divide to form daughter granules and behave like chromosomes except that an equatorial plate is not formed. In *L. donovani* likewise a spindle is formed, and though an equatorial plate appears, individual chromosomes could not be distinguished. Thus in both cases nuclear division is by a modified mitosis.

C. M. W.

LWOFF (André). **Croissance hypertrophique, division multiple et constitution de la cinétide de** *Leishmania donovani* **Lav. et Mes., type** *infantum* **Ch. N.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 160–163. With 20 figs.

The author, who has obtained very rich cultures of *L. donovani* in a blood-bouillon medium, noted that nuclear multiplication sometimes proceeded so rapidly as to give rise to multinucleated plasmodia which contained as many as ten to fifteen nuclei, kinetoplasts and flagella. These forms resembled the well-known multinucleated forms which occur during the reproduction of *Trypanosoma lewisi* in the blood of the rat. Certain flagellates possessed a terminal spine which stained deeply. This represented the last point of attachment of two daughter flagellates resulting from longitudinal fission. The spine is regarded as representing the remains of a centrodesmose which, during division of the kinetoplast, connects the daughter kinetoplasts. In some flagellates fibres originating in the blepharoplast could be detected. There was usually a single fibre, but in other cases two were present. The fibre varied in length. Sometimes it ended in the cytoplasm before reaching the nucleus, at other times it appeared to pass into the nucleus, while in some flagellates it was continued past the nucleus to the posterior end of the body towards the spinous process, with which in rare cases it was actually connected. The fibre again is regarded as the remains of the centrodesmose.

C. M. W.

GREIG (E. D. W.) & KUNDU (S.). **Observations of Glycosuria and Blood Sugar Content in Kala-Azar.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 695–699. [5 refs.]

The paper records a case of kala azar in which glycosuria was a prominent feature. The blood sugar content as estimated by MACLEAN's method was 0·461 per cent., while the urine contained 38·4 grains of sugar per ounce. In kala azar cases generally the sugar content of the blood is low, so that it would appear that in this case, in a patient 17 years of age, the condition was probably due to damage to the beta cells of the Islands of Langerhans caused by the Leishmania. The patient was treated with insulin and urea stibamine and made an uninterrupted recovery. As he was young there is a good chance that the damage to the beta cells will be repaired.

C. M. W.

NATTAN-LARRIER (L.). **La leishmaniose cutanée de la Guyane.**—*Bull. Acad. Méd.* 1925. Mar. 17. Year 89. 3rd Ser. Vol. 93. No. 11. pp. 308–310.

The paper gives a short summary of knowledge regarding cutaneous leishmaniasis in Guiana. Though there are no morphological differences between the parasites as seen in the diseases of the old and new worlds it is possible that the S. American parasite is actually distinct from *L. tropica.* Furthermore, it is suggested that the disease in Guiana may not be merely a mild form of that occurring in other parts of S. America but a distinct entity.

C. M. W.

ARBERNAZ (Paulo Mangabeira). **Tumores fibroides do septo nasal na leishmaniose.**—*Sciencia Medica.* 1925. Feb. 28. Vol. 3. No. 2. pp. 113–125. With 4 figs. [32 refs.]

A new type of lesion in cases of S. American leishmaniasis is described. It consists of a fibrotic nodule, painless and with little tendency to haemorrhage, which is fixed to the nasal septum by a broad base. That the nodule was actually due to leishmania appears to have been deduced from the fact that characteristic lesions occurred on other parts of the body. The differential diagnosis is discussed in detail. Treatment consists in removal of the growth by the galvanocautery.

C. M. W.

AIR MINISTRY. **Report on the Health of the Royal Air Force for the Year 1923.** [MUNRO (D.), Director of Med. Services, R.A.F.]. 1925. Feb. Air Publication 1103. [Oriental Sore. p. 68.]

An unsuccessful attempt was made to transmit oriental sore by means of *Phlebotomus papatasii* bred in England. A number of flies were fed on two sores, one of which was of the non-ulcerating variety and the other ulcerating. The flies were then allowed to feed daily for sixteen days on two non-immunes and for seventeen days on a third. During a year's observation there were no signs of infection.

C. M. W.

ATKINS (R. R. G.). **Some Observations on Oriental Sore.**—*Jl. Roy. Army Med. Corps.* 1925. Mar. Vol. 44. No. 3. pp. 213–215.

From experiences with the treatment of oriental sore in Mesopotamia the author believes that X-ray treatment with zinc ionization gives better results than any other. A tube of a penetration equal to four on Benoist scale, with a current of three M.A., was used over a filter of leather a quarter of an inch thick.

C. M. W.

CASTELLANI (Aldo). **The Treatment of Oriental Sore by Means of Phosphorus.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 480–481. [2 refs.] [United Fruit Company, Boston, Mass.]

Since his last note on the subject (this *Bulletin,* Vol. 20. p. 874) three further cases of oriental sore have been treated by applications of B.P. phosphorus oil or actual injections into the skin round the sore. Healing takes place in from 3 weeks to 3 months.

C. M. W.

D'ALMEIDA (Carlos) & REBÊLO (Frederico). **Contribution à la thérapeutique des ulcères leismaniques.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 67–73.

It has been noted that oriental sore is by no means an uncommon disease in Angola. Various methods of treatment which have been tried are reviewed by the authors, who have found that intravenous injections of tartar emetic give the most satisfactory results. Intramuscular injections of the same drug also bring about a cure, but less rapidly. Local applications of Bouin's fluid, presumably accidentally applied in the first place, prove of great assistance in accelerating the healing process.

C. M. W.

SHARP (N. A. Dyce). **Oriental Sore in Nigeria.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6, p. 336.

A record of a case of oriental sore in Kaduna. Treatment with intravenous tartar emetic did not bring about a cure. After five weeks, when 15 grains had been injected, the treatment was abandoned. Tartar emetic ointment (10 per cent) was then applied for half an hour. It caused much pain, for which morphia was given. The ointment was then removed with castor oil. The sore healed in eleven days.

C. M. W.

MOSCHKOWSKY (Sch.). **Ueber die Einwirkung von Germanin (" Bayer 205 ") auf Leishmanien.** [The Action of " Bayer 205 " on Leishmania.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 1. pp. 40–44. [9 refs.]

A number of cases of oriental sore of Turkestan origin were treated with " Bayer 205 " injected either intravenously, or into the tissues round the sore. In no case was any improvement noted. A case of infantile kala azar similarly failed to respond to the drug injected intravenously. It was also noted that the drug had no influence on the cultural forms of *Leishmania tropica* when tested *in vitro.*

C. M. W.

DOSTROWSKY (A.). **Ueber einen neuen endemischen Leishmaniaherd in Palästina.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Mar. 1. Vol. 29. No. 3. pp. 101–111. With 4 text figs. [11 refs.]

ABRAHAM (J. Johnston). **Oriental Sore in a New Centre in Palestine.** [Correspondence.]—*Lancet.* 1925. May 30. pp. 1161–1162.

The author has discovered an endemic centre of oriental sore in Palestine, at Artuf, a village through which the old Turkish Jaffa-Jerusalem railway passed. He discusses various problems relating to the disease without producing anything really new. He mentions the case of a child from Baghdad who had 158 sores on the face and limbs.

Abraham, referring to the focus at Artuf, believes that during the war the disease was introduced by the Egyptian labourers who were provided with camps in and around the village.

C. M. W.

NEVEU-LEMAIRE. **Observation clinique de boutons d'Orient multiples.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 44–47. [2 refs.]

This is a record of a case of oriental sore in which the patient developed multiple sores after being badly bitten by what appeared to be sand flies in Aleppo. It is usually stated in the text-books that the initial lesion resembles an insect bite, but the author thinks it would be more accurate to state that the initial lesion always commences at the site of an insect bite. The first lesions considered as oriental sores appeared in the case described after an incubation period of eighteen days. Subsequently other sores developed till a total of fifteen were present.

C. M. W.

i. DE BUEN (Sadi). **El kala-azar infantil. Instrucciones para su diagnóstico y tratamiento.** 2ª edición.—Ministerio de la Gobernación Publicaciones de la Dirección general de Sanidad. Madrid. 8 pp. With 5 figs.

ii. TIMPANO (Pietro). **Un caso di Kala-Azar in una donna di 23 anni.**—*Policlinico.* Sez. Prat. 1925. Apr. 13. Vol. 32. No. 15. pp. 526–527. [13 refs.]

iii. MALLARDI (Mario). **Ancora sulla leishmaniosi infantile in provincia di Bari.**—*Pediatria.* 1925. Apr. 1. Vol. 33. No. 7. pp. 383–384.

iv. WOLLSTEIN (Martha). **A Case of Kala-Azar in an Infant.**—*New York State Jl. of Med.* 1925. Mar. 13. Vol. 25. No. 9. pp. 413–417. With 5 text figs. [18 refs.]

v. FURUMORI (Kamehira). **[On a Case of Kala-Azar occurring in Tokyo.]**—*Chugwai Iji Shimpo* (*Central Med. Jl.*). 1925. Jan. Vol. 44. No. 2. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 66.]

vi. CHATTERJEE (Anukul Chandra). **The Race, Class, Sex and Age Incidence of Kala-Azar.**—*Indian Med. Rec.* 1925. May. Vol. 45. No. 5. pp. 129–132.

vii. GHOSH (N. L.). **A New Factor in the Control of Kala-Azar.**—*Ibid.* 1925. Jan. Vol. 45. No. 1. pp. 4–6.

viii. CANNATA (S.). **Contributo alla terapia della leishmaniosi infantile.**—*Pediatria.* 1925. May 1. Vol. 33. No. 9. pp. 449–452. [1 ref.]

ix. GALLO (Carmine). **Ricerche sul contenuto in ferro del sangue nelle anemie spleniche e nella leishmaniosi infantile.**—*Ibid.* 1925. Mar. 1. Vol. 33. No. 5. pp. 251–256. [13 refs.]

i. The author, who has had experience of kala azar in Spain (this *Bulletin,* Vol. 20, p. 568), has written this little pamphlet in which he outlines the symptoms, distribution, methods of diagnosis and treatment of the disease. About 100 cases have so far been diagnosed in the country.

ii. A record of a case of kala azar in a woman 23 years of age in Reggio, in Southern Italy. Treatment with tartar emetic was successfully carried out.

iii. A record of four further cases of infantile kala azar in Italy.

iv. A case of kala azar in an infant who had come to New York from Palermo, in Sicily. Treatment with tartar emetic was instituted, but the child died from septicaemia following noma.

v. A case of kala azar in a woman in Tokyo who had contracted the disease in Pekin.

vi. In the author's experience of kala azar in certain villages of Bengal race, sex and station in life have no bearing on the incidence of the disease. The majority of patients are between 5 and 15 years of age. Though cases in children under one year of age have been reported, the author himself has not met with any.

vii. The author points out that treatment of all cases of kala azar in an infected village or locality is a sure method of exterminating the disease, for antimony treatment, even if it fails to cure every case, renders them non-infective to others.

viii. The treatment of cases of infantile kala azar in Messina has shown that certain cases which appeared to be resistant to potassium antimony tartrate responded readily when the sodium salt was substituted.

ix. An examination in Italy of the iron content of the blood in 12 cases of infantile kala azar, 10 cases of splenic anaemia and 4 healthy children gave the following results in parts per thousand :—kala azar 0·06–0·36, splenic anaemia 0·30–0·46, healthy controls 0·35–0·55.

C. M. W.

i. DE MELLO (Froilano), REBELLO (Frederico) & PAES (Santana). **Sur quelques cas de leishmaniose cutanée observés à Mossâmedes.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 419–423.

——, PINTO (J. Ferreira), REBELLO (Frederico) & PAES (Santana). **Nouvelle iconographie sur la leishmaniose cutanée à Angola.**—*Ibid.* pp. 425–428. With 3 plates.

ii. MONTPELLIER (J.). **"Clou de Biskra" observé dans les environs d'Alger.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 249–251. [1 ref.]

iii. CÉARD (L.). **Existence du bouton d'Orient dans le Sahara Oranais.**—*Ibid.* 1924. Dec. 10. Vol. 17. No. 10. pp. 886–887. [1 ref.]

iv. LEBLANC (L.). **Existence du bouton d'Orient à Figuig (Maroc Oriental).**—*Ibid.* 1925. Feb. 11. Vol. 18. No. 2. pp. 146–148. [2 refs.]

v. BASU (D. N.). **An Interesting Case of Oriental Sore.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 166–167. With 1 text fig.

i. In these two papers the author calls attention to the existence of oriental sore in Angola, cases having been discovered in Mossamedes, Benguella and Lobito.

ii. A description of a case of oriental sore in a youth who had lived on the Algerian littoral. Another similar case is mentioned in a footnote. These two cases are the 13th and 14th to be recorded from the districts of Algeria outside the well-known endemic zone of the Sahara.

iii. A case of oriental sore has been seen in the South Oranais district of Algeria, showing that the endemic focus of the disease extends towards Morocco.

iv. The discovery of three cases of oriental sore in Figuig combined with the previous observations at Bou-Anane shows that an endemic centre of the disease exists in a district 800 kilometres to the south-west of Biskra.

v. Record of a case of oriental sore in a child in Calcutta, the infection having taken place during a visit to the Punjab six and a half to seven months before the commencement of the disease.

C. M. W.

RABIES: A REVIEW OF RECENT ARTICLES. III.*

In reviewing the literature on Rabies which has been published during the last six months we note with satisfaction that the trend of expert opinion is slowly but steadily turning away from methods involving the injection of large quantities of nerve material, and is gradually being focussed upon dilution methods, in particular upon those which have been carbolized. The reason for this movement is an increasing realization that "accidents paralytiques" are preventible occurrences which have become too obtrusive in institutes that have to deal with large numbers of patients. It is impossible, for example, to remain unimpressed by the fact that in one institute over a period of nine years there occurred no less than thirty-nine cases, in eight of which a fatal issue ensued. KORITSCHONER and SCHWEINBURG[1] have described these cases in detail, and have submitted them to a rigorous analysis. SCHWEINBURG now gives fuller details of the experiments which were referred to in the last summary (*ante* p. 249). He proves conclusively that paralytic accidents are a function of the quantity of nerve substance administered, and that they occur as frequently with normal as with rabid brain substance. HERMANN[2] from various experiments concludes in favour of a carbolized virus. KARLOWSKI[3] in Warsaw, and TRON[4] in Milan contrast statistics, and decide in favour of a similar method of treatment. It must be remembered that with the advent of treatment by carbolized vaccines there must follow, in all temperate climates at least, the dispatch of vaccine to general practitioners and the decline of Pasteur Institutes as centres for treatment. In other words, rabies vaccine will be prepared and issued just as bacterial vaccines are prepared and issued. HERMANN draws attention to this, KARLOWSKI is prepared to issue the vaccine, and in India, where such vaccines have been in use for many years, experiments (unpublished) are being carried out by STEVENSON and KING on the effects of tropical temperatures upon antigenic value.

The Virus.—CORNWALL[5] discusses the significance of appearances which he has noted in the Negri body. He believes that the great majority of these bodies are the expression of the intracellular growth of a specific organism. He ascribes the course of infection of the cell to the entrance of a small "spore," which increases to visible dimensions and is recognised as a small Negri body. Under favourable circumstances these increase still further and develop vaccuoles in each of which may be seen a darkly stained "corpuscle" of varying form. The body becomes filled with ripe corpuscles, and he believes that he has observed a splitting of the capsule, and the emergence of the corpuscles into the cytoplasm of the nerve cell. Photographs are reproduced showing this rupture. PANISSET and VERGE[6] also discuss the work of LEVADITI, MANOUELIAN and VIALA, and conclude that recent researches appear to show that it is " plausible " that the agent of rabies is protozoal (microsporidial) in character.

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* For the second of this series see *ante*, pp. 242-251.

[1] KORITSCHONER (Robert) & SCHWEINBURG (Fritz). Klinische und experimentelle Beobachtungen ueber Lahmungen nach Wutschutzimpfung.—*Ztschr. f. Immunitatsf. u. Experim. Therap.* 1925. Mar. 2. Vol. 42. No. 3-4. pp. 217-283. [82 refs.]

[2] HERRMANN (Otto). Immunisation gegen Tollwut mit verschiedenen Vakzinen.—*Cent. f. Bakt.* I. Abt. Orig. 1925. Mar. 10. Vol. 94. No. 5. pp. 296-303. [12 refs.]

[3] KARLOWSKI (Z.) [In Polish.] Szczepionki przeciwko wściekliźnie. Les vaccins contre la rage.—*Medycyna Deświadczalna i Społeczna.* Warsaw. 1925. Jan.-Feb. Vol. 4. No. 1-2. pp. 139-159. With 1 text fig. [29 refs.]

[4] TRON (Giorgio). I nuovi metodi di vaccinazione antirabica.—*Terapia.* 1925. Jan. Vol. 15. No. 67. pp. 1-11. [20 refs.]

[5] CORNWALL (J. W.) On Negri Bodies.—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 601-603. With 2 plates. [9 refs]

Deterioration and Preservation of the Virus.—The statement of REMLINGER that at the end of the 2,200th passage the Tangier strain of fixed virus is less resistant, and not only attenuates more rapidly on desiccation, but also when preserved in glycerine, is discussed by BURNET[7, 8] and PLANTUREUX[9, 10]. BURNET has noted no deterioration in the Tunis strain which was obtained from Paris 38 years previously. His rabbits die on the 7th to 8th day. Nor has he noticed any reduction in its keeping properties in glycerine, the period of its infectivity being greater than twenty days. PLANTUREUX found that infective properties were retained after eleven to thirteen days. He concludes from his experiment that the best preservative is Legroux's glycerinated formol serum, in which the virus remains virulent up to twenty days. This medium is prepared as follows. A mixture of 1 cc. of formaline in 600 cc. of serum is prepared, and shaken thoroughly. To this mixture are added 1,200 cc. aq. dest. and 450 cc. glycerine. The mixture is again shaken and sterilized at 110° C. in the autoclave. REMLINGER and BAILLY,[11] on the other hand, believe that glycerine is superior to glycerinated formol serum, as with the latter they obtained irregular results, accompanied in some cases by contamination.

MARIE[12] has found that the infective properties of fixed virus are destroyed when a 1 per cent. emulsion is placed for some hours at 30° C. in contact with an equal quantity of the filtrate of a culture of *B. subtilis.* When the filtrate had been previously heated to 100° C., the infective properties were not lost after similar treatment at a temperature of 38° C.

Virulence of Particular Strains.—REMLINGER[13] in an attempt to account for failures of treatment for which no obvious cause can be found, and for which, all too frequently, the burden of blame is laid upon the virulence of the infecting strain, has compared the virulence for guineapigs of two strains of street virus which differed widely in their virulence for rabbits. The result was as follows :—

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[6] PANISSET (L.) & VERGE (J.). Les recherches récentes sur la nature du virus rabique.—*Rev. Générale de Méd. Vétérinaire.* 1924. Dec. 15. Vol. 33. No. 396. pp. 682–685.

[7] BURNET (Et.). Sur la conservation des moelles pour le traitement antirabique. —*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 83–89. [8 refs.]

[8] BURNET (Et.). Sur la conservation des moelles pour le traitement antirabique. —*C.R. Soc. Biol.* 1925. Mar. 7. Vol. 92. No. 8. pp. 562–563.

[9] PLANTUREUX (Edm.). Influence de la dessiccation, de la température et de la glycérine sur un virus rabique fixe au 1.5000e passage, conservations des moelles rabiques en sérum formolé.—*C.R. Soc. Biol.* 1925. Feb. 6. Vol. 92. No. 4. pp. 253–254. [3 refs.]

[10] PLANTUREUX (Edm.). Conservation des moelles rabiques en sérum formolé glycérine et en sérum phéniqué.—*C.R. Soc. Biol.* 1925. May 15. Vol. 92. No. 16. pp. 1292–1293. [4 refs.]

[11] REMLINGER (P.) & BAILLY (J.). Le sérum formolé ne peut pas remplacer la glycérine pour la conservation du virus rabique.—*C.R. Soc. Biol.* 1925. May 8. Vol. 92. No. 15. pp. 1196–1198. [3 refs.]

[12] MARIE (A. C.). Virus rabique et *Bacillus subtilis.*—*C.R. Soc. Biol.* 1925. Mar. 7. Vol. 92. No. 8. pp. 561–562. [3 refs.]

[13] REMLINGER (P.). Les virus rabiques renforcés peuvent-ils rendre compte de certains échecs du traitement pasteurien ?—*C.R. Soc. Biol.* 1925. Mar. 13. Vol. 92. No. 9. pp. 681–682. [2 refs.]

Virus of normal virulence for rabbit (Killed 1st subpassage 14th day)—
20 vaccinated. 5 died. Mean time to death, 18 days.
10 controls. 8 died. Mean time to death, 18 days.
Virus of high virulence for rabbits (Killed 1st subpassage 8th day)—
20 vaccinated. 6 died. Mean time to death, 15 days.
10 controls. 8 died. Mean time to death, 12 days.

The forty vaccinated guineapigs had been treated with an ether virus, each animal receiving 20 cc. of brain emulsion. It would appear that there is no relation between virulence towards rabbit and virulence towards guineapig. This, he claims, is in accordance with BABES' results, which showed that whilst wolf virus is highly virulent for man, when injected into rabbits it leads to a prolonged incubation period (20–24 days). In this connection also ROCHAIX[14] describes a case in which the patient was bitten deeply in the hand by a cat. Treatment was commenced on the following day ; one year later the patient, after preliminary pleuro-pneumonic symptoms, died of typical hydrophobia. An emulsion of medulla of the patient was inoculated into the muscles of the necks of three guineapigs (two of which died on the 18th day and one on the 24th), and subdurally into a rabbit which died of dumb rabies on the 14th day. There was thus no evidence of attenuation of the virus. ROCHAIX finds an explanation in a former statement by REMLINGER that the virus may remain latent in the nerve centres for long periods of time, and may be brought into activity by secondary influences such as trauma, cephalitis, emotion, or, as occurred in the case which he is discussing, local cold (leading presumably to the pleuro-pneumonic symptoms described). REMLINGER, on the other hand, uses ROCHAIX's case to substantiate his argument that the virulence of a strain towards one species of animal may be independent of its virulence towards another. REMLINGER's results as published are quite insufficient to decide the matter. If incubation period is the criterion of virulence, then one might retort that in his " normal " series there is no evidence that the previous treatment by ether vaccine was of any value whatsoever ; if, as is more proper, the percentage mortality is taken as the criterion of virulence, then he has furnished only one figure regarding the percentage mortality for the rabbit ; that is to say, he has no adequate basis of comparison.

Virulence of Blood and Cerebrospinal Fluid.—HERRMANN[15] has found that the virus may be present in the blood not only of experimental animals but of those naturally infected. In one case he obtained a positive result from the serum of the heart blood of a woman who had died of the disease. The period of incubation in a rabbit was 245 days, as compared with 27 and 63 days in rabbits inoculated with an emulsion of the brain of the same patient.

He has also conducted experiments[16] on the transmission of the virus through the placenta. After the death from rabies of a guineapig infected with street virus, a foetus was found *in utero*. The brain of this foetus was tested by intracerebral inoculation into three guineapigs. One died from the operation, the other two contracted the disease after eight and eleven days respectively. He finds that if a birth occurs either during the course of the disease or within the period of nine to eleven days prior to the onset of symptoms the offspring is affected, whereas if the period is as long as twenty days there is no transmission.

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[14] ROCHAIX (A.). Sur un cas de rage à incubation prolongée.—*C.R. Soc. Biol.* 1924. Dec. 5. Vol. 91. No. 34. pp. 1217–1218. [1 ref.]

[15] HERRMANN (Otto). Die Ansteckungsfähigkeit des Blutes bei Lyssa humana.—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Feb. 18. Vol. 94. No. 3–4. pp. 201–204. [9 refs.]

[16] HERRMANN (Otto). Die Vererbung der Wut durch die Plazenta.—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 20. Vol. 94. No. 1. pp. 42–45. [8 refs.]

GÉRARD[17] reports the development of rabies in a guineapig inoculated with the cerebrospinal fluid of a patient suffering from the disease.

Virulence of Saliva.—From a further series of experiments HERRMANN[18] concludes that the saliva of patients who have died of rabies is probably always infective. In order to demonstrate this fact it is necessary to use fresh saliva, and to observe the inoculated animal over a lengthy period.

Symptoms.—CORNWALL[19] confirms a previous finding (*Indian Journal Med. Res.*, VII, No. 1, p. 148), that a rise in blood sugar supervenes upon subdural inoculation of fixed virus into rabbits. This increase is a terminal phenomenon.

Diagnosis.—A new method of staining Negri bodies is presented by EPSTEIN[20]. After fixation in methyl alcohol or acetone, and cutting in paraffin, the sections are subjected to the following procedure :—

1. Placed in 5 per cent. Tannic Acid for 15 minutes at room temperature.
2. Stained in 1 to 5 per cent. Fuchsin S. (in 3 per cent. Anilin water) over a weak flame until steam rises, then washed.
3. Placed in 0·3 to 0·5 per cent. Thionin (in aq. dest.) for 10 to 15 seconds until section becomes dark blue-violet, then washed.
4. Placed in 10 per cent. Aurantia (in 70 per cent. alcohol) for 5 to 10 seconds until section is the colour of tobacco.
5. Absolute alcohol for 3 to 5 seconds until section appears green.
6. Finally, in xylol or toluol, where the tissue becomes transparent, and of a light yellow colour.

[N.B.—The aurantia must be the red brown crystalline powder manufactured by Grübler and others, and not the light gold amorphous powder which is frequently sold.]

By this method the protoplasm is stained light greenish yellow, the nuclei blue, the erythrocytes appear vermillion in colour, the Negri bodies are rose to purple red, whilst the nucleoli are grey to black violet. Accordingly Negri bodies are sharply distinguishable from the nucleoli of the ganglion cells.

Canine Rabies in Africa.—Canine rabies has been described by Dr. BOYÉ as occurring in the middle Congo region ; BLANCHARD and

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[17] GÉRARD (F.). [A Fatal Case of Hydrophobia.]—*Rev. Tunisienne des Sci. Méd. et Tunis Médical réunis.* 1924. Aug. [Summarized in *Brit. Med. Jl.* (Epitome of Current Medical Literature.) 1924. Dec. 20. p. 89.]

[18] HERRMANN (Otto). Virulenz des Speichels des lyssa-kranken Menschen und Einfluss anderer Krankheiten auf den Verlauf der Tollwut.—*Cent. f. Bakt.* 1. Abt. Orig. 1925. May 15. Vol. 95. No. 1. pp. 67–69. [6 refs.]

[19] CORNWALL (J. W.). Estimation of Blood Sugar in Normal Rabbits and in Rabbits inoculated subdurally with Rabies Fixed Virus.—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 581–582. With 1 fig. [1 ref.]

[20] EPSTEIN (H.). Beitrag zur zytologischen Diagnose der Lyssa.—*Cent. f. Bakt.* 1. Abt. Orig. 1924. June 16. Vol. 92. No. 1–2. pp. 71–72. [3 refs.]

LEFROU report cases from Brazzaville. REPETTO[21] now describes two cases which he has observed in the Lower Congo. In the brains of each of these, Negri bodies were found, but owing to faulty technique confirmation by the animal test failed.

Statistics of Treatment.—FANANÁS[22] publishes the statistics of the National Institute of Hygiene in Madrid. During the years 1922 and 1923, 2,661 persons were treated, of whom 2,037 were bitten by dogs. One death occurred, *i.e.*, a mortality of 0·037 per cent. The treatment was by the method of Högyes.

Statistics from Lemburg are presented by GASIOROWSKI and MEISEL[23]. During the three years 1921–1923, 5,830 persons were treated by dried cords (1 to 4 days dried, and thereafter preserved in 50 per cent. glycerine). Of these 12 died, 8 either during or within 14 days after completion of treatment. The failures were thus 4, or 0·064 per cent. Three cases of paralytic accident occurred; two involved mainly the facial nerve, and one was a transverse myelitis.

KARLOWSKI[3] furnishes statistics from Warsaw. After a lengthy summary of the relative advantages of the various methods of treatment he decides in favour of a carbolized vaccine. He gives the following figures :—

Persons arriving within 1st week 32,999 ; of whom 130 died : rate 0·39 %
" " " 2–4th " 6,122 ; " " 25 died : rate 0·40 %
" " later than 4th week 300 ; " " 6 died : rate 2·0 %

YEGUCHI[24] reports upon the results of treatment in the Dairen Hospital (Manchuria). In all, 452 cases have been treated during the period of eight years ending 1916. The vaccine employed was at first 1–7 day dried cords ; this has now been altered to 1–5 day dried cords. The vaccine has been distributed for the treatment of 249 other patients in surrounding places. There have been no untoward effects.

Prophylactic Vaccination of Dogs.—The number of papers published gives evidence of the interest which has been aroused in this direction as a result of the Japanese experience. Most of these communications discuss in detail the historical evolution of the method, and are in this sense general in character. KRAUS[25] recommends for Vienna a voluntary system of dog inoculation, and suggests as an incentive that dogs treated in this manner should be exempted from tax. After a few years, if satisfactory results are obtained, vaccination might be made obligatory. PUNTONI[26] believes that prophylactic vaccination of dogs is a good coadjuvant, but insists that other methods of dog control should not be neglected. MURILLO[27] has used Umeno and Doi's method over a period of six months. He does not state how many dogs were dealt with, but all apparently remained in health. EICHHORN[28] and MOORE[29] present the subject as a basis for discussion at a meeting of American Veterinarians.

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[21] REPETTO (R.). Quelques cas de rage canine au Bas-Congo.—*Revista Méd. de Angola.* (No. especial 1º Congresso de Med. Trop. da Africa Ocidental. Vol. 5. 9a. 10a. e Sessão de encerramento.) 1923. Aug. No. 4. pp. 111–114. [2 refs.]

[22] RAMÓN Y FANANÁS (J.). Estadística de los cacos tratados por el método antirrábico de Högyes en el Instituto Nacional de Higiene de Alfonso XIII durante los años 1922–1923.—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 125–129.

[23] GASIOROWSKI (N.) & MEISEL (H.). Stacja Pasteurowska we Lwowie w okresie 1919–1923. Die Pasteursche Station in Lemberg in den Jahren 1919–1923.—*Medycyna Doświadczalna i Społeczma.* Warsaw. 1924. Vol. 3. No. 5–6. pp. 436–452. German summary pp. 448–449. With 1 fig. [10 refs.]

[24] YEGUCHI (Churoku). [On the Antirabic Inoculation.]—*Namman Igakkai Zasshi* (*Jl. of South Manchuria Med. Soc*). 1924. Apr. Vol. 12. No. 6. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 294.]

[25] KRAUS (R.). Vorschläge zur Schutzimpfung gegen Hundswut.—*Seuchenbekämpfung.* 1925. Vol. 2. No. 1–2. pp. 71–74.

Methods of Treatment.—KRAUS[30] recommends Calmette's method of storage of dried cords in glycerine for institutes which have to deal with a comparatively small number of patients. The cords of different ages are stored in glycerine and kept in the ice chest. He dispatches to general practitioners tubes each containing a piece of dried cord in glycerine. This has to be emulsified by the administrator. Eight hundred persons have been treated in this way without any local or general accidents, and, in particular, no accidental paralyses have been observed. [As these are to be expected approximately only once in 2,000 times, this is not remarkable.] KRAUS concludes that " perhaps HARRIS's dried and powdered vaccine would be better."

HERRMANN[2] finds that the duration of treatment is more important than the quantity of material introduced. Also that the mere additon of carbolic acid to a vaccine which has been killed by heat does not reduce its immunizing properties. He advocates exposure for half an hour at 58-60° C., with addition subsequently of carbolic acid to ½ per cent.

REMLINGER[31] recommends the use of etherized vaccines for the treatment of dogs and cats. Brains are placed in ether for 25, 20, and 15 hours respectively. The ether is removed, and the tissue emulsified in 50 cc. of sterile saline, strained through muslin, and injected under the skin. A dose of one brain is administered on three occasions with intervals of either one or two days. Perhaps three inoculations are unnecessary; perhaps the period of action of the ether may be altered. Excellent results have been obtained with dog and cat, both prophylactically and curatively. These will be published at a later date.

The period of Infectivity of the Saliva of the Biting Animal.—Four papers have been communicated regarding the period of time prior to the development of symptoms during which the saliva of the biting animal may be infective. The question has an important application. REMLINGER does not treat persons bitten if the dog is alive and well fifteen days after biting. The Indian Pasteur Institutes have shortened the period to ten days, and in all Pasteur Institutes a rule of this sort is acted upon. It must be remembered at the outset that a large number of patients have been dealt with on this basis, all over the world and throughout the past forty years. It will be admitted that a death from rabies amongst this group would not escape recognition and report. The procedure agreed upon thus rests upon a vast body of statistical experience ; and in no case, so far as we are aware, has a death from rabies occurred. The reviewer would suggest to directors of Pasteur Institutes that figures relating to this point would be valuable, and should be published.

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[26] PUNTONI (Vittorio). Sulla vaccinazione antirabica preventiva dei cani.—*La Clin. Vet.* 1924. Nov. Vol. 47. No. 11. pp. 637-643.

[27] MURILLO (Gerardo Agustín). La rabia canina. Vacunación antirrábica por el método Umeno.—*Rev. Hig. y Sanidad Pecuarias.* 1925. Apr. Vol. 15. No. 4. pp. 244-245.

[28] EICHHORN (A.). Discussion on Rabies.—*Cornell Veterinarian.* 1925. Apr. Vol. 15. No. 2. pp. 227-229.

[29] MOORE (Veranus A.). Rabies and its Control.—*Cornell Veterinarian.* 1925. Apr. Vol. 15. No. 2. pp. 217-226. [15 refs.]

[30] KRAUS (R.). Ueber eine ökonomische Methode der Schutzimpfung gegen Hundswut.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1924. Aug. 27. Vol. 41. No. 1. pp. 92-96. With 1 text fig.

[31] REMLINGER (P.). Vaccination du chien et du chat contre la rage au moyen du virus-éther.—*C. R. Soc. Biol.* 1925. May 8. Vol. 92. No. 15. pp. 1195-1196.

We now turn to four papers which deal with this point. The first, by PANISSET and VERGE,[32] discusses the question from a general point of view. In the second, DE MELLO,[33] after a long introduction, bearing on previous findings, reports the case of a dog, the details of which are as follows :—

10.12.23 : bit two children.
24.12,23 : bit a little girl.
Five or six days later : bit a cow.
4.1.24 : bit father of little girl.
From 11.1.24 was carefully watched for a week, during which period it also bit a passer-by. It became "ennuyeux" and was killed.

The little girl bitten on 24.12.23 developed rabies and died on the 25.2.24. The only symptom apparent in the dog was a tendency to biting.

RAHMET BEY[34] describes a case in which a boy developed rabies fifty-one days after being bitten ; the dog was seen to be alive and well thirty-three days after it inflicted the bite.

HERRMANN[35] draws attention to a third case, in which a dog bit a calf early in August, 1924. About two weeks later (15.8.24) it bit two persons ; on 23.9.24 it bit a woman ; on 7.10.24 it bit a further person after having been ill for five days. It died of rabies on 10.10.24. The calf died of rabies in October, and one of those bitten on 15.8.24 developed rabies and died on 10.10.24.

It would appear that the period of infectiveness of the saliva had been prolonged to twenty-six days in DE MELLO'S case, to at least thirty-three days in that of RAHMET BEY, and to seventy days in the case described by HERRMANN.

The problem is associated with the vexed question of recovery from rabies, and of periodic rabies (*lyssa recurrens*). This latter condition has been described by THEVENOT, by LÖTE and by KONRADI. HERRMANN[35] goes on to examine the condition experimentally. He claims, basing his conclusions upon slight variations of body temperature and of weight, that it can be produced in animals either by the use of weak viruses, or in animals whose resistance has been raised by previous vaccination. He also considers that it occurs under natural conditions comparatively frequently. It is always difficult to estimate the value of evidence taken from individual cases such as those of DE MELLO, RAHMET BEY, and HERRMANN. With regard to the experimental work of HERRMANN it is to be noted that he observed similar periodic variation after inoculation with cholera vaccine.[36]

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[32] PANISSET (L.) & VERGE (J.). La durée de la période d'observation des animaux "mordeurs".—*Rev. Générale de Méd. Vétérinaire.* 1925. Mar. 15. Vol. 34. No. 399. pp. 173–176. [21 refs.]

[33] DE MELLO (Froilano). Sur la durée de surveillance des chiens mordeurs pour dépister la rage canine.—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. June. 9th Ser. No. 6. pp. 239–246.

[34] RAHMET Bey (H.). Hydrophobia and Carriers.—*Med. Jl. & Record.* 1924. Dec. 17. pp. 591–595. [1 ref.]

[35] HERRMANN (Otto). Experimentelle und natürliche Lyssa recurrens.—*Cent. f. Bakt.* 1. Abt. Orig. 1925. May 15. Vol. 95. No. 1. pp. 69–74. [8 refs.]

Accidents during the Course of Treatment.—IONESCO[37] and HERRMANN[36] draw attention to anaphylactic symptoms arising as a result of treatment. The former describes a case in which these took the form of a micro-papulo-vesicular eruption with marked eosinophilia. The latter, to subcutaneous infiltrations probably due to contamination in the vaccine administered. He finds that anaphylactic symptoms do not occur after the administration of a carbolized vaccine.

PAMBOUKIS[38] describes two cases of paralytic accidents, and KORITSCHONER and SCHWEINBURG,[1] in the paper to which we have already referred, describe in detail thirty-nine cases.

AVEZZU[39] describes a case in which trigeminal and facial symptoms prevailed.

In all these cases the reason is not far to seek. The reviewer may be permitted to express the pious hope that in the near future these occurrences will have only an historic interest, for with the adoption of more rational methods of treatment they will cease to occur.

Miscellaneous.—SATOMI, MIURA, and HIRAKAWA[40] tested fourteen pigments, and found that three of these: " thiobenzenyl, oxazin, and nitro pigments had postponed the development of symptoms a little longer than the controls."

LIN[41] after a general discussion on rabies pleads for more active realization of the dangers of rabies in China, and for preventive action against the spread of the disease.

A. G. McKendrick.

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[36] HERRMANN (Otto). Anaphylaxie bei antirabischen und anderen Impfungen. —*Cent. f. Bakt.* 1. Abt. Orig. 1925. Mar. 10. Vol. 94. No. 5. pp. 290–296. [8 refs.]

[37] IONESCO (Dimitrie). Eruption micro-papulo vésiculeuse généralisée pendant le traitement antirabique.—*Bull. et Mém. Soc. Méd. Hôpit. de Bucarest.* 1925. Jan. Vol. 7. No. 1. pp. 14–15.

[38] PAMBOUKIS. Sur quelques lesions du système nerveux provoquées par les injections antirabiques.—*Grèce Méd.* 1924. Dec. Vol. 26. No. 12. pp. 93–94.

[39] AVEZZU (Guido). Le paralisi da trattamento antirabico.—*Gazz. d. Ospedali.* 1923. Vol. 44. No. 54. pp. 632–634. [27 refs.]

[40] SATOMI (Mitsuwo), MIURA (Tsunesuke) & HIRAKAWA (Hiroshi). [On the Influence of Pigments against the Rabies Virus.]—*Nihon Biseibutsu Gakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. Sept. Vol. 18. No. 12. [Summarized in *Japan Med. World.* 1925. May 15. Vol. 5. No. 5. pp. 130–131.]

[41] LIN (C. S.). Antirabic Measures and their Practical Application.—*Nat. Med. Jl. China.* 1924. Oct. Vol. 10. No. 5. pp. 319–326. With 4 figs. [2 refs.]

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

CHAPCHEFF (C.). **Les détails de la transmission de la fièvre récurrente européenne par les poux.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 97–105. Also [in Russian] in *Med. Practice* Kharkov. 1924. No. 1–2. 11 pp.

The author has worked in Russia with a strain of European relapsing fever [*S. recurrentis*] and first gives details of the examination of lice obtained from patients at different periods of the attack.

Spirochaetes were found in 13 out of 138 lice collected from patients between the 2nd and 18th day of the disease, head lice and body lice being equally infected. One of 14 *Phthirus pubis* taken from a patient between the 6th and 8th days of the fever showed spirochaetes in the stomach, but not in the haemolymph and other organs. 507 lice from healthy subjects in an uninfected locality were fed on patients in various stages of relapsing fever, and subsequently on two healthy subjects. The latter never became infected, although receiving more than 6,000 bites, a confirmation of previous observations [see this *Bulletin*, Vol. 1, p. 33] that the louse does not transmit the infection by its bite alone.

These lice were examined daily for the presence of spirochaetes, and the results fall into three groups :—

(1) Lice (115) fed during the non-febrile period between attacks never showed spirochaetes.

(2) Lice fed on patients during the first or second febrile attack, which subsequently showed spirochaetes in the haemolymph, or other parts of the body ; and

(3) Lice which, although fed two or three times on patients having spirochaetes in their blood, never showed any signs of the infection. These lice were all fed after the epidemic began to diminish in severity, and the author suggests that this inability to develop in the louse, as well as the disappearance of epidemics, is due to falling off in the infective power of the spirochaetes.

As regards (2), when lice were kept at 22°-25° C., spirochaetes ingested into the stomach became granular within 3 hours, and disappeared entirely within the first 24 hours. After a negative period of about 10 days, spirochaetes reappeared in the haemolymph, and were present throughout the remainder of the life of the insect.

For infection to be produced when an infected louse feeds, it is necessary for the haemolymph to get on to the skin of the subject, and the author points out that even the loss of a leg is quite enough to allow this escape.

In conclusion, the author discusses the relapsing fevers transmitted by ticks and is of the opinion that the louse, in comparison, is a comparatively recent host.

E. Hindle.

BLANCHARD (Maurice). **Les spirochétoses aiguës de l'Afrique Equatoriale Française.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 259–272.

A summary of the various acute spirochaetal infections occurring in the French Congo.

Relapsing fever is the first to be considered, the species concerned being *Sp. duttoni.* The disease is transmitted by *Ornithodorus moubata,* which occurs in the Colony in considerable numbers. The method of triple centrifuging is recommended for the examination of the blood in suspected cases, as the parasites are often extremely rare and cannot be found by ordinary methods. The repeated trial of atoxyl as a medicament is suggested, as in one case accidentally treated by this compound the symptoms of the disease disappeared at once.

Spirochaetal jaundice is next considered, of which no less than 15 cases occurred in three months at the native hospital at Brazzaville. The clinical symptoms are said to closely resemble those of yellow fever in a certain number of cases. The spirochaetes were never observed by direct examination of the blood or urine, but only after triple centrifuging.

A guineapig was infected by inoculation of blood from one of the patients and died 25 days later with the usual symptoms. The virus was maintained through five guineapigs, after which it was lost through the recovery of the last of these animals.

Bed bugs (*Cimex lectularius*) collected from the beds occupied by the patients were ground up in saline and inoculated into a guineapig which died on the 11th day without showing any spirochaetes, but with intense jaundice. A guineapig inoculated from the first one died 25 days later and showed the typical Leptospira and jaundice. Stegomyia captured in the rooms occupied by the patients were also inoculated into guineapigs with negative results. Attempts were made to transmit the disease from infected to healthy guineapigs by the bites of bed-bugs, and the author again states that the bites of these insects were infective up to the 38th day after an infecting feed. [See this *Bulletin* (BONNE), Vol. 20, p. 139, and Vol. 22, p. 183.]

The third section is devoted to "Blackwater fever," which was exceptionally common at Brazzaville during 1922. In none of these cases was the author able to find the spirochaete originally described by himself and LEFROU as causative organism of this disease [see this *Bulletin,* Vol. 20, p. 142]. The theory is put forward that the "spirochaetal blackwater fever" only occurs in the region of the Congo known as "Le Couloir," and especially in the neighbourhood of the Rivière Noire and Léfini, as the author has never observed these spirochaetes in the blood of patients who had not been in these regions. Moreover, it is said to be very difficult, sometimes impossible, to distinguish between ordinary cases of blackwater and the spirochaetal variety, the distinction being made only by the discovery of the organism, for which triple centrifuging is necessary. If spirochaetes are present, the use of arsenicals or mercury is indicated.

A summary of the various characters of the acute spirochaetal infections of the French Congo is given in tabular form.

E. H.

GUILLET (René). **Fièvre récurrente à Brazzaville.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 273–278. [3 refs.]

An account of an outbreak of 12 cases of "tick fever" among the native soldiers at Brazzaville. All showed a first attack of two or three days, followed in most cases by a disappearance of the fever, but two or three showed relapses. Spirochaetes were observed in the blood of only one patient by direct examination, but in two others after centrifuging. *Ornithodorus moubata* was very common in the prison and police post, but not in the town, which explains why only males were attacked. Intravenous injections of 0·70-0·75 gms. of novarsenobenzol in most cases were curative after a fortnight, but patients who had shown oedema or jaundice required two or three months' recovery, during which continued injections seemed to have no effect.

E. H.

GRAHAM (J. D.). **La fièvre récurrente dans l'Inde Britannique.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. Jan. Vol. 17. No. 1. pp. 23–30. [21 refs.].

In the north-west Punjab an epidemic of relapsing fever broke out during the winter of 1923 and continued until the summer of 1924, as shown in the following table :—

	1923.			1924.							
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Total.
Cases	124	266	383	1,302	724	5,022	5,277	3,323	2,894	299	16,614
Deaths	16	46	95	325	58	489	306	291	256	20	1,902

In addition to this epidemic, an earlier one occurred in the Province during 1923, with a record of 28,830 cases, with 7,568 deaths, but these figures are said to be unreliable, as plague and malaria were also present.

The United Provinces record 360 deaths from relapsing fever in 1922 and 250 in 1923.

Burma is said to be relatively free from the disease, but cases are sometimes imported, especially among the Chinese coolies.

Kashmir suffered from a severe epidemic in 1923–1924, which was supposed to be a mixture of relapsing fever and typhus, but its exact nature is still uncertain.

E. H.

RAJU (K. V.). **Notes on Some Cases of Relapsing Fever.**—*Indian Med. Gaz.* 1924. Dec. Vol. 59. No. 12. pp. 616-618. With 1 chart.

A description of the symptoms and treatment of 29 cases of relapsing fever admitted to the Railway Hospital, Hubli [Southern Bombay]. The number of spirochaetes in the blood is stated to be a rough guide to prognosis and no case with more than about 20 per field ever recovered. The intravenous injection of 0·45 gm. novo-arsenobenzol cuts short the pyrexial attack, and in the majority of cases cures the patient, but in a few cases there is a relapse, and then the apyrexial interval is always prolonged. In order to be certain of curing the disease it was found advisable to give a second injection of the same dose, about 5 days after the temperature had fallen. The temperature chart is given of an abnormal case of relapsing fever.

E. H.

HESSE (Erich). **Zur Kenntnis der chirurgischen Komplikationen und Nachkrankheiten des Fleckfiebers, Rückfallfiebers und des Paratyphus N. (Erzindjan), einer Mischinfektion des Recurrens.** [The Surgical Complications and After-Effects of Typhus, Relapsing Fever and of Paratyphoid N. (Erzindjan), a Mixed Infection of Relapsing Fever.]—*Arch. f. Klin. Chirurg.* 1924. Vol. 128. pp. 739–814. [Numerous refs. in footnotes.]

The monograph describes the surgical complications of typhus and relapsing fever and mixed infections of the latter and paratyphoid. During the years 1915-1923 the author has dealt with 406 such conditions, which are described in detail. It is evident that during this period, as a result of the economic changes which told hardly on the health of the population, the percentage of surgical complications of these diseases was considerably increased (see this *Bulletin*, Vol. 21, p. 729).

E. H.

COLLIER (W. A.). **Ueber Pathogenität und Virulenzänderungen verschiedener Rekurrensstämme für den Menschen.** [Changes in the Pathogenicity and Virulence of Various Strains of Relapsing Fever.]—*Deut. Med. Woch.* 1925. Jan. 23. Vol. 51. No. 4. pp. 137–138. [13 refs.]

The use of relapsing fever for the treatment of paralysis in various European hospitals has given opportunities of observing the virulence of different strains of this disease in man. The continued passage of relapsing fever spirochaetes through mice enhances their virulence for these animals, but, at the same time, destroys their virulence for other hosts. Two laboratory strains of European relapsing fever maintained in laboratory animals for some years at the Georg Speyer-Haus were found to have lost their virulence for man.

The author has experimented with a strain of African relapsing fever kept in mice for about twelve years. It had maintained its virulence for man and had also acquired resistance against salvarsan; after further passage through mice for a year it suddenly lost its virulence for man, though the same strain maintained in culture for the same period had retained its virulence. Moreover, both strains continued to be resistant against salvarsan.

E. H.

PLAUT (F.). **Ueber Rekurrensimpfung.** [Relapsing Fever Inoculations.]—*Deut. Med. Woch.* 1925. Mar. 6. Vol. 51. No. 10. pp. 387–388.

After referring to COLLIER'S observations [see above], the author describes his own experience with strains of relapsing fever employed in the treatment of paralytics. The Frankfurt strain of *S. recurrentis*, maintained for 10 years by passage through mice, had lost its virulence for man. A strain of *S. duttoni* that had been kept for 12 years at the Hamburg Tropical Institute was found to be losing its virulence for human beings, and was also resistant to salvarsan. Two months later, after passage through the intermediate host (ticks), the spirochaetes recovered their virulence for man, but were still arsenic resistant. This strain has now been kept in mice for six years, except for two passages through man, and still remains virulent both for mice and man. Moreover, no change has been observed in its therapeutical utility.

E. H.

SCHUSTER (Helene). **Anatomische Untersuchungen bei Recurrens im Kindesalter.** [Anatomical Investigations on Relapsing Fever in Childhood.]—*Beitr. z. path. Anat. u. z. allg. Path.* 1924. Vol. 72. pp. 669-686. [35 refs.]

The author describes the results of post-mortems on 29 children between the ages of 2 weeks and 11 years, who had died from relapsing fever in Lemberg. The disease is very dangerous to young children, and seems to be invariably fatal to those under one year of age, Inflammation of the lungs was observed in 50 per cent. of the cases and inflammation of the kidneys also in 50 per cent., these being the most prevalent complications.

E. H.

TOMIOKA (Y.). **Experimenteller Beitrag zur Frage der Immunität bei Recurrens und ihrer Beeinflussung durch die Salvarsantherapie.** [Observations on Immunity in Relapsing Fever and its Influence on Salvarsan Treatment.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. June 16. Vol. 92. No. 1-2. pp. 41-61.

An extension of the work of BUSCHKE and KROÓ [see this *Bulletin*, Vol. 21, p. 268], who were the first to show that in experimental infections of Russian relapsing fever the spirochaetes invade the brain substance and may remain there for some weeks after they have disappeared elsewhere. The author has employed a similar strain of spirochaetes, but used a "percutaneous" method of inoculation. Contrary to what one might have expected, animals thus infected showed a higher percentage of deaths, and also more relapses, than those infected sub-cutaneously or intra-peritoneally. With mice the mortality rate for the former was 70 per cent., as compared with 42 per cent. for the latter The method employed was to leave a drop of infected blood on the shaved belly of the mouse for about half an hour, and to wash it off after it had dried; infection invariably succeeded.

A number of mice were infected and their brains examined for spirochaetes by inoculation into normal mice at varying intervals after the beginning of the infection; up to 21 days after, the brains of all examined contained spirochaetes, but after 36 days only one out of five.

The effects of salvarsan treatment on the presence or absence of spirochaetes in the brain was very marked when a sufficiently large dose was given at an early stage of infection.

These results support the view that it is important to treat relapsing fevers, as well as syphilis, with massive doses as early as possible, in order to destroy the parasites before they have had time to invade the central nervous system and develop resistant forms. BUSCHKE and KROÓ's hypothesis that the presence of latent forms in the brain is linked up with immunity is thus discountenanced, since mice were proved to be still immune against re-infection several weeks after the usual time of the disappearance of the infection from the brain. Moreover, animals that had been cured by early injections of neo salvarsan were also immune against re-infection.

E. H.

KRANTZ (Walther). **Eine einfache Methode zur Konservierung von Rekurrensspirochäten.** [A Simple Method of preserving Relapsing Fever Spirochaetes.]—*Muench. Med. Woch.* 1925. Jan. 2. Vol. 72. No. 1. pp. 12–13.

The white of a hard-boiled egg is cut up into pieces about 0·5 to 1 cc. in size, which are distributed in 12 to 15 test-tubes. Each tube is then charged with 10-15 cc. of sterilized physiological salt solution, and after closing is placed in the steam sterilizer for one hour on two successive days. When 2 to 5 drops of blood containing the spirochaetes are added, the blood cells settle on to the coagulated albumen, and the spirochaetes remain in the liquid. The tubes are then kept in the ice-chest. The author found living and virulent spirochaetes of European relapsing fever four to six weeks after they had been introduced. The organisms do not seem to multiply in the tubes.

E. H.

ARISTOWSKY (W.) & HOELTZER (R.). **Ein neuer Nährboden zur Kultivierung der** *Spirochaete Obermeieri.* [A New Medium for the Cultivation of *S. obermeieri.*]—*Cent. f. Bakt.* 1 Abt. Orig. 1925. May 1. Vol. 94. No. 7/8. pp. 448–452.

A continuation of previous work by Aristowsky on the cultivation of *Spirochaeta obermeieri* [*recurrentis*]. The authors now recommend the following method, as better :—

A piece of brain of rabbit, or cattle brain (obtained at the butcher's), about 0·5-1 cm. in diameter, is dropped into a test-tube and covered with a few cc. of physiological saline. The tube is then sterilized in the autoclave for 15 minutes at 120° C. The saline is poured out, leaving the piece of sterile brain tissue, and now 8 cc. of fresh horse serum are added, followed by the liquid containing the spirochaetes. In the case of sub-cultures, about 0·5 to 1 cc. of the culture is used for inoculating the fresh tubes. Finally, a layer of paraffin oil is added and the tubes incubated at 35° C.

Spirochaeta recurrentis is said to grow very rapidly in this culture medium. Sub-cultures should be made every 48 hours, and the authors have found that after 60 passages the organism still retained its virulence, though it had already had 75 passages in Aristowsky's earlier culture medium (employing boiled albumen). After two or three days in the incubator the cultures may be kept at room temperature and the spirochaetes remain active for at least a fortnight.

The horse serum used for these cultures was obtained from horses that had not been fed overnight ; the blood was placed in the incubator for two hours and subsequently in the ice chest, and the serum removed as soon as it formed. The serum of some rare individuals is, however, unsuitable for the cultivation of spirochaetes. The layer of paraffin oil seems to act by preventing alterations in the alkalinity of the serum.

E. H.

BRUYNOGHE (R.) & DUBOIS (A.). **Action du radium sur le** *Treponema duttoni, in vitro.—C.R. Soc. Biol.* 1925. Feb. 20. Vol. 92. No. 6. p. 466. [1 ref.]

Spirochaetes (*S. duttoni*) were exposed to the action of the B and Y-rays for periods up to 47 hours, but although the incubation period of the infection, produced by the subsequent inoculation of these organisms into mice, was prolonged, the action of the rays was only feeble. Exposure to the emanations (5 millicuries) for 5 and 23 hours respectively destroyed the infective powers of the spirochaetes, although their motility was unaffected.

E. H.

DE MELLO (F.) & MESQUITA (B. P.). **Sur les spirochétoses intestinales humaines dans l'Inde Portugaise.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 857–861.

The authors examined for spirochaetes the faeces of 51 normal individuals who neither at the time of examination nor during the past six months had suffered from any intestinal troubles. The following tabulated results show no evidence of *Spirochaeta eurygyrata* possessing any pathological significance.

No spirochaetes observed	2 cases.
1-5 spirochaetes in each field of microscope ...	19 „
5-10 „ „ „ „ ...	8 „
10-15 „ „ „ „ ...	6 „
15-20 „ „ „ „ ...	6 „
20-50 „ „ „ „ ...	7 „
More than 50—often innumerable	3 „
Total of individuals examined	51 cases.

The faeces of patients suffering from various intestinal affections were also examined, and again no evidence was obtained of any connection between the pathological conditions and the presence or absence of spirochaetes. In all except two cases the species observed was *Spirochaeta eurygyrata* Werner 1909, *emend.* Fantham, 1916, and the characters of the organism are redescribed by the authors.

E. H.

DE MELLO (F.) & MESQUITA (B. P.). **Essais expérimentaux de traitement de la spirochétose humaine à** *Sp. eurygyrata,* **par quelques spirillicides modernes.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 861–863.

Intravenous injections and also enemata of neosalvarsan are found to have no effect on *S. eurygyrata,* and injections of the bismuth compounds Muthanol, Neotrépol and Trépol, and also Dermatol administered *per os,* three per diem, for six consecutive days, caused the spirochaetes to disappear from the faeces in three cases tried, and in two re-examined a month later they were still absent.

E. H.

HOFFMANN (W. H.). **Las enfermedades espiroquéticas consideradas desde el punto de vista inmunológico.** [Spirochaetal Diseases from the Immunological Aspect.]—*Siglo Méd.* 1923. 20 pp.

This article comprises a consideration of most of the spirochaetal diseases from the point of view of their immunity reactions, briefly indicating how these may be made use of in diagnosis, treatment and prophylaxis. Thus, for diagnosis, the production of antibodies and the complement-fixation test are applicable. In relapsing fever antibodies are produced with fair rapidity so that the spirochaetes disappear from the blood, but only after a considerable period are these antibodies formed in quantity sufficient to destroy the organisms, hence the relapses. In syphilis, on the other hand, the immunity is due to incomplete cure, and when definite cure is brought about there is no longer any true immunity. As regards treatment the serum of convalescent patients or that of animals after inoculation may be used, as for example, in relapsing fever, Weil's disease and yellow fever; while for the last the immune serum has been employed with good results as a prophylactic measure. " In leptospiral infections treatment by serum is the best of all," whereas in syphilis the chief point aimed at and attainable is to increase the natural defences of the body by chemical means, though the author looks forward to the time when a prophylactic vaccination will be found against syphilis.

H. Harold Scott.

DE LAVERGNE (V.) & FLORENTIN (P.). **Fuso-spirochétose à localisation rectale.**—*C.R. Soc. Biol.* 1925. May 1. Vol. 92. No. 14. pp. 1097–1098. [3 refs.]

In a case of amoebic dysentery in Syria the authors observed that a small ulcer in the upper part of the rectum was covered by a membrane in which they were able to demonstrate spirochaetes and fusiform bacilli like those in Vincent's angina. It is suggested that this affords an explanation of the improvement of certain cases after the use of arsenicals.

E. H.

FRANCHINI (Giuseppe) & MAGGESI (Bruno). **Reperto di spirochete in un caso mortale di febbre biliosa emoglo binurica.** [The Finding of Spirochaetes in a Fatal Case of Blackwater Fever.]—*Policlinico.* Sez. Med. 1925. Feb. 1. Vol. 32. No. 2. pp. 96–104. With 2 text figs. [7 refs.]

The observations were made in a patient who died of blackwater fever in Italy after his return from Katanga, in Africa, where he had suffered from malaria and jaundice. Examination of the blood and organs did not reveal any malarial parasites, though pigment was present in the leucocytes. It is claimed, however, that by triple-centrifugation of the blood a few spirochaetes similar to those described by BLANCHARD and LEFROU (this *Bulletin*, Vol. 20, p. 138) were discovered. They were also said to be present in the spleen and in inoculated guineapigs. [The claim that malaria was excluded by the examinations made cannot, of course, be accepted, while the microphotograph of the leptospira bears no resemblance to any organism, and is only of use in serving to illustrate what the authors are willing to accept as evidence of infection.]

E. H.

LEGER (Marcel). **Spirochètes sanguicoles, au Sénégal, de l'homme de la Musaraigne et de divers Muridés.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 279–285. [10 refs.]

A useful summary of the records of relapsing fever in Senegal, together with a consideration of the spirochaetes found in Crocidura (shrew-mouse) and in various rodents. The author has found that *Sp. crocidurae* (see this *Bulletin,* Vol. 20, p. 139) occurs naturally in a fairly high percentage of animals, for out of 30 *Crocidura stampflii,* 6 were infected, 3 *Mus decumanus* out of 30, 4 *Mus coucha* out of 20, and 4 *Golunda campanae* out of 30; the spirochaete, in all, closely resembles that from cases of human relapsing fever in Senegal, and the suggestion is made that they may serve as a reservoir of the disease. The relapsing fever of Senegal seems to differ from both *Sp. recurrentis* and *Sp. duttoni*; and as *Ornithodorus moubata* does not occur there, it would be necessary to assume a new method of transmission if the above-mentioned animals act as a reservoir of the virus.

E. H.

DRAGTEN (Stuart). **Spirochaeten op de slijmvliezen van trachea en bronchiën, en de bronchitis spirochaetosa van Castellani.** [Spirochetes on the Mucosa of Trachea and Bronchi, and the Bronchitis Spirochetosa of Castellani.]—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 153–177.

The paper gives a summary of the literature of spirochaetal bronchitis, and the results of examination of normal animals and of 150 human cadavers. Spirochaetes in no way different from *S. bronchialis* (except that they remained alive 8-10 hours after the death of the host) were commonly met with. They were more numerous in cases where the bronchial or tracheal mucosa showed signs of inflammation, but never exceeded in number 4 spirochaetes per slide. It therefore seems reasonable to conclude that the finding of spirochaetes morphologically identical with *S. bronchialis* should justify the diagnosis "bronchitis spirochaetosa" only in those cases where the organisms are present in large numbers.

N. H. Swellengrebel.

DE MELLO (Froilano). **Première contribution à l'étude des spirochétides d'Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 287–313. With 29 figs. [9 refs.]

The author elaborates a morphological method of identifying spirochaetes based on the length, obtained by the measurement of about 100 individuals, divided by the average number of turns in the spirals. In this way is obtained a so-called "index of morphological identification" which is claimed to be of great value in distinguishing different races. The author employs the biometrical method of showing the length and number of turns in the spirochaetes measured, and in this way the mean length, etc., is very easily obtained, as the results are plotted in the form of a curve. This method has the additional advantage of enabling one to identify two or more species that occur together, as, for example, in the case of the mouth spirochaetes (see this *Bulletin,* Vol. 20, p. 137, and Vol. 21, p. 736).

The method is then applied to the identification of spirochaetes occurring in the intestine of a termite in Angola. *Saprospira hominis* is next described as it occurs fairly frequently in human faeces in Angola, and a chart is given illustrating its dimensions.

Sp. eurygyrata was found in the faeces of all except 5 per cent. of the natives, and curves are given illustrating the dimensions of the spirochaetes in three cases. Two of these had the typical dimensions of *S. eurygyrata*, but the third also contained giant forms, whicn are supposed to be of animal origin.

Spirochaetes of the *eurygyrata* type were found in the faeces of various mammals such as the horse, mule, rabbit, guineapig, cattle, goat, sheep, cat, dog and pig, and the measurements of large numbers of specimens show that this spirochaete possesses individual variations in each species.

E. H.

DE MELLO (Froilano), D'ALMEIDA (Carlos) & REBELLO (Frederico). **Deuxième contribution à l'étude des spirochétidés de la Province d'Angola.**—*Revista Méd. de Angola.* (No. especial 1^e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 315–326. With 3 plates.

The first part is concerned with the identification of the spirochaetes in a case of Vincent's angina in a negro, employing the biometrical method previously described. The average length was found to be 10μ to 20μ with a suggestion of the existence of two types, one 8μ to 12μ in length, and the other 13μ to 19μ. The majority of the spirochaetes had 6 to 11 spirals.

The second part [by Rebello] comprises notes on the spirochaetes of relapsing fever in Angola, together with a description of giant forms found in a case of this fever. Whereas the usual dimensions of this spirochaete are 11μ to 21μ in length, with an index of 3 (see above), in one case the average length was 20μ to 40μ, with an index of 2·4.

The third part [by de Mello] consists of a study of the spirochaetes found in "fuso-spirillary ulcers." Sometimes only one type of spirochaetes is found in the ulcer, whilst in other cases two or more types may be distinguished and the results are given of the measurements of 100 individuals of each of the various types. The author is of the opinion that the small fine type of spirochaetes is identical with *Sp. vincenti*, but fuso-spirillary ulcers may be caused by several races or species of spirochaetes associated with fusiform bacilli.

E. H.

PHILIBERT (André). **Conception moderne des spirochétoses.**—*Médecine.* Paris. 1924. Dec. Vol. 6. No. 3. pp. 207–212.

The author's conclusions are summarized in the statement that "spirochaetes are essentially septicaemic organisms, affecting secondarily the liver, kidney, meninges and nervous system; contagious by direct contact, or by an intermediate host in the body of which the parasite undergoes a cyclical evolution. They do not confer immunity."

E. H.

i. ADAMS (D. K.), BLACKLOCK (J. W. S.) & M'CLUSKIE (J. A. W.). **Spirochaete-like Structures in the Cerebro-Spinal Fluid of Animals used for Experimental Purposes.**—*Jl. Path. & Bact.* 1925. Jan. Vol. 28. No. 1. pp. 115–116. With 1 plate. [3 refs.]

ii. ——, —— & ——. **Spirochaetes in the Ventricular Fluid of Monkeys inoculated from Cases of Disseminated Sclerosis.**—*Ibid.* pp. 117–118. With 1 plate. [6 refs.]

i. The first article contains the description and figures of spirillar structures found almost constantly in the cerebro-spinal fluid of monkeys, rabbits, and guineapigs. Figures of *Spirochaeta cuniculi* are given for comparison. Although the authors consider that the pseudo-spirochaetes "must be recognised as a source of confusion with true spirochaetes," the figures of these structures show very little resemblance to these characteristically-shaped organisms.

ii. The second article contains the account of spirochaetes found in the ventricular fluid of two monkeys (*Macacus rhesus*) inoculated with material from cases of disseminated sclerosis.

E. H.

JAKIMOV [YAKIMOFF], (V. L.). **A Case of Febris Volhynica (quintana).**—*Rev. Microbiol. & Epidemiol.* Saratov. 1924. Vol. 3. No. 3. English summary p. 214. [In Russian pp. 117–124. [46 refs.].]

Description of a case in a young man from Kiew. There were five febrile attacks, and in the first febrile period spirochaetes differing from *recurrentis* were seen in the blood. They had "the appearance of short structures with irregular curves." The author is favourably inclined to the view that these organisms are the causative agents of Febris Volhynica. The name *Spirochaeta Hissi-Werneri* is proposed in honour of the original describers of the disease.

E. H.

i. ACHITOUV (M.). **Mensuration des courbures des spirochètes.**—*C. R. Soc. Biol.* 1924. Dec. 5. Vol. 91. No. 34. pp. 1192–1194. With 1 text fig.

ii. DELAMARE (G.) & ACHITOUV. **Détermination des indices de courbure de spirochètes schématiques.**—*Ibid.* 1925. Jan. 23. Vol. 92. No. 2. pp. 81–82. With 1 text fig.

iii. DELAMARE (G.) & ACHITOUV. **Indices de courbure de** *S. recurrentis* **(var.** *venezuelensis*) **et** *S. icterohemorragiae.*—*Ibid.* Mar. 27. No. 11. pp. 863–865.

iv. TAKEUCHI (Nobuyuki). **The Comparative Pathological Studies on the Rocky Mountain Spotted Fever. 1. Morphological Researches on the Origin of the Disease.**—*Aichi Jl. Experim. Med.* 1924. Dec. 20. Vol. 1. No. 4. pp. 175–195. With 8 figs. on 2 plates. [37 refs.]

v. ABBATUCCI & GRAVELLAT. **Le typhus exanthématique est-il une spirochétose ?**—*Presse Méd.* 1924. May 14. Vol. 32. No. 39. p. 425. With 1 chart.

vi. SCHWARZ (Y.). **Broncho-Pulmonary Spirochaetosis.**—*Lancet.* 1924. Dec. 27. pp. 1331–1334. With 3 text figs.

i. A mathematical formula for the measurement of the length of each curve of a spirochaete.

ii. The measurement of the index of curvature of two drawings of spirochaetes in BRUMPT's "Précis de Parasitologie." See above.

iii. The measurement of the index of curvature [see above] of 100 spirals of BRUMPT's drawings of *S. recurrentis* (var. *venezuelensis*) and an equal number of *S. ictero-haemorrhagiae*. The index of the former varied between 0·13 and 0·57, the average being 0·32 ; in the latter, the figures range from 0·43 to 1·18, with an average of 0·79.

iv. See this *Bulletin*, Vol. 21, pp. 664 and 927 (HAYASHI & TAKEUCHI)

v. A comparison of the clinical features of spirochaetal infections and typhus fever leads the authors to suspect, as others have done, that the latter disease also may be a spirochaetosis.

vi. Observations on six cases of spirochaetal infection of the bronchia has led the author to speculate on their pathogenicity and origin and their relation to fusiform bacilli.

E. H.

BEZANCON (Fernand) & ETCHEGOIN (Eugenio). **Présence des spirochètes dans les crachats hémoptoïques.**—*C. R. Soc. Biol.* 1925. Jan. 23. Vol. 92. No. 2. pp. 55–56. [1 ref.]

DIMITRACOFF (C.). **Broncho-spirochétose de Castellani.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Jan. 1. Year 40. 3rd Ser. Vol. 48. No. 39. pp. 1774–1776. [11 refs.]

HUDSON (Bernard), MORLAND (A. J.) & ZIMMERLI (E.). **Broncho-Pulmonary Spirochaetosis.** [Correspondence.]—*Lancet.* 1925. Jan. 17. p. 156. With 2 text figs.

KOUWENAAR (W.). **Spirochaetosis febrilis.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 219–237.

DE MELLO (Froilano). **Caractères du** *Spirochaeta bronchialis* **Cast.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 899–906.

MIRONESCO (Th.). **Spirochétose bronchiale et autres spirochétoses observées en Roumanie.**—*C. R. Soc. Biol.* 1925. May 1. Vol. 92. No. 14. pp. 1164–1166. [5 refs.]

RAT-BITE FEVER.

LANFORD (J. A.) & LAWSON (E. H.). **Etiology of Rat Bite Fever. Preliminary Report.**—*New Orleans Med. & Surg. Jl.* 1925. Mar. Vol. 77. No. 9. pp. 349–351. With 3 text figs. [9 refs.]

Description of a case of rat-bite fever occurring in New Orleans. By injecting white mice with material obtained from a swollen lymph node in the neighbourhood of the bite, 42 days after patient had been bitten by a rat, the typical *Spirochaeta morsus muris* [*Spirillum minus*] was recovered. In the discussion on the paper, it was stated that very frequently cases of this disease give a positive Wassermann reaction.

E. Hindle.

MONROE (P. W.) & MOOSER (Herman). **A Case of Rat-Bite Fever.**—*Jl. Amer. Med. Assoc.* 1925. Mar. 21. Vol. 84. No. 12. p. 890. [2 refs.]

The report of an occurrence of this disease in Mexico City, in an English boy who had been bitten by a rat. Animals inoculated with the serum from the site of the wound became infected and showed the typical organisms [*Spirillum minus*] in the blood. The patient was cured by injections of neo-arsphenamin.

E. H.

WEISS. **Ueber die "Rattenbisskrankheit."** [Rat-Bite Fever.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. May 1. Vol. 29. No. 5. pp. 244–248.

A description of two cases of this disease observed in Europeans in Kenya Colony, and successfully treated by injections of salvarsan.

E. H.

AOKI (Kaoru), SAKAI (Kikuwo) & HAYASHI (Toshiteru). **[On Spirochetosis of the Mouse and Other Animals.]**—*Tokyo Ijishinshi* (*Tokyo Med. News.*). 1924. Oct. No. 2390. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. pp. 40–41.]

The authors record the presence of a spirochaete [presumably *Spirillum minus*] in the blood of mice, rats, and other rodents.

E. H.

INFECTIOUS JAUNDICE.

KÖRNER. **Ueber eine Epidemie von Weilscher Krankheit.** [An Epidemic of Weil's Disease.]—*Deut. Med. Woch.* 1925. May 8. Vol. 51. No. 19. pp. 772–774. [16 refs.]

Description of an outbreak of infectious jaundice occurring in July and August, 1924, at a police school near Magdeburg, in the course of which about 76 patients showed one or other of the signs of the disease, but only 26 definite jaundice. Incidentally, the author mentions that many other cases were observed in the neighbouring districts, and also slaughter-house cattle showed signs of jaundice. Spirochaetes were not observed in these cattle, but the possibility that they served as agents for the dissemination of the disease is mentioned.

In the school epidemic, patients were treated by injections of immune serum from rabbits that had been infected with spirochaetal jaundice. A marked improvement was observed in most cases and the development of jaundice arrested.

After a lengthy account of the symptoms of some of the cases, the author discusses the mode of infection, and comes to the conclusion that the baths in a certain bathing establishment were responsible, for as soon as it was closed no further cases of the disease were observed.

[It should be noted that Leptospira were not observed in any of these cases, the diagnosis being based on clinical symptoms. In two cases the blood of convalescents was found to agglutinate *Spirochaeta ictero-haemorrhagiae* in cultures.]

E. Hindle.

LYON (D. M.). **Spirochaetal Jaundice. Report of a Small Epidemic. With Microscopical and Experimental Observations by** BUCHANAN (G.).—*Lancet.* 1925. Mar. 7. pp. 504–507.

The first part of this article gives details of seven cases of spirochaetal jaundice occurring in Edinburgh during the summer of 1924. They occurred in two families, and in the first one there is evidence suggesting that the source of infection was a small child from Kelantan (Malay Peninsula), who was afterwards found to be infected.

The clinical symptoms are described in detail. The most pronounced were gastro-intestinal disturbances, jaundice and haemorrhages; in addition, nausea, anorexia, sickness and vomiting were present in all. Three of the cases were given each two injections of 10 cc. of anti-spirochaetal serum prepared from a strain of spirochaetes isolated from rats caught in East Lothian. In all, the injection was followed by the temperature returning to the normal, but no other effect was noticed.

The second part of the paper [by G. Buchanan] deals with the microscopical and experimental observations. Spirochaetes were observed in the urine of all seven; in one case they were present up to the 66th day of the disease, an unusually long period, as they generally disappear before the 40th day. Blood was obtained from three cases, but both direct examination and animal inoculations were negative. Altogether, 44 animals were inoculated with the urine of the patients, and although 7 animals showed the characteristic localized lung haemorrhages, only one showed typical spirochaetal jaundice, with spirochaetes present in the organs. In a final discussion, the author shows that infection by contact is strongly suggested and as the agency of spread points to the urine.

E. H.

GOUDSMIT (J.), HAMMER (E.) & WOLFF (J. W.). **Onderzoekingen bij een geval der ziekte van Weil.** [Studies on a Case of Weil's Disease.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Jan. 31. Vol. 69. 1st Half. No. 5. pp. 430–442. With 1 plate & 1 fig. [9 refs.]

Clinical, pathological-anatomical and bacteriological examination of a case of Weil's disease of a man in Zaandam, ending fatally within a week (17-24 October, 1924). The clinical features led to the probable diagnosis of Weil's disease.

The anatomical finding did not reveal any marked alterations; the liver showed a highly developed uncomplicated degeneration, the kidneys an acute interstitial inflammation with numerous Leptospira, mainly localized in the interstitial tissues; no splenomegaly; orange-yellow tinge and numerous small haemorrhages on the skin. Scanty Leptospira were present in the muscles of the heart and the intercostal muscles; none in spleen, liver and lungs.

The blood-serum taken shortly before death did not agglutinate cultural Leptospira cultivated from Amsterdam rats and from a Berlin case of Weil's disease, whereas the serum from a patient of Weil's disease collected in Paris caused agglutination up to a dilution of 1 : 50. Repetition of the agglutination-test being made impossible by the death of the patient, two guineapigs were inoculated in the peritoneum with material from his liver (although no Leptospira were found there). These animals suffered from typical Weil's disease, so did the subinoculated ones, death occurring in 6–7 days after inoculation (except one which recovered and remained a carrier of Leptospira). Cultures likewise succeeded. The serological affinities of this human strain form the object of a study, the results of which will be published later.

The cause of the occurrence of this isolated case is not known. But on October 8th the patient fell into a backwater of the river Zaan in the neighbourhood of a number of cess-pits and of the public dustheap, where rats are numerous (2 out of 7 were found infected with Leptospira).

N. H. Swellengrebel.

DE LAVERGNE (V.) & PERRIER (P.). **A propos d'un cas de spirochétose ictéro-hémorragique. Absence d'agglutinines spécifiques. Parallélisme entre l'évolution de l'azotémie et la marche de la température.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Apr. 2. Year 41. 3rd Ser. Vol. 49. No. 12. pp. 513–516. [2 refs.]

Description of a case of infectious jaundice, apparently acquired as a result of bathing in the Marne. There is no question about the diagnosis either clinical or experimental, and yet the patient's blood, collected on the 15th and 35th days of the disease, and examined by Dr. PETTIT, contained no specific agglutinins.

The authors discuss the febrile symptoms of infectious jaundice and show that there is a correlation between the temperature and the amount of urea, or other waste nitrogenous matters, in the blood. When azotaemia appears, the temperature falls and remains low until the amount of urea in the blood returns to the normal, when it again rises. The disease thus shows two febrile attacks separated by a period of low temperature, during which there is an excess of urea in the blood. This elimination of nitrogen is supposed to act as a check on the temperature, and the authors suggest that without this there would be continuous fever in cases of infectious jaundice.

E. H.

TAPIE (Jean) & BOUNHOURE (L.). **Deux cas de spirochétose à forme méningée.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Apr. 30. Year 41. 3rd Ser. Vol. 49. No. 14. pp. 604–609. [7 refs.]

The description of two cases of meningitis, in both of which spirochaetes ultimately appeared in the urine, and in one case slight jaundice developed. It is to be noted, however, that these spirochaetes were inoculated into guineapigs with negative results; and the serum diagnosis in the only patient examined was also negative. The authors consider that there may be a spirochaete, (allied to *S. icterohaemorrhagiae*) pathogenic for man and not for guineapigs.

[From the author's description of this spirochaete as "faiblement onduleux," there is considerable doubt about their identification, for such a term could hardly describe the appearance of the Leptospira of infectious jaundice.]

E. H.

VANNI (Vittorio). **Sulla diagnosi di spirochetosi ittero-emorragica.** [The Diagnosis of *Spirochaeta ictero-haemorrhagiae.*]—*Policlinico.* Sez. Prat. 1925. Jan. 19. Vol. 32. No. 3. pp. 81–82. [4 refs.]

The author finds that if Leptospira are inoculated intraperitoneally to guineapigs they can be detected in the blood 24 to 48 hours later. In doubtful cases of Weil's disease 5 cc. of the patient's urine should be inoculated intraperitoneally into guineapigs and the heart blood of the animal examined 48 hours later.

E. H.

KURODA (Tsu). **[Experimental Studies on the Therapy of Weil's Disease. I. Communication.]**—*Chiba Igakkwai Zasshi (Jl. of Chiba Med. Soc.).* 1924. Nov. Vol. 2. No. 6. [Summarized in *Japan Med. World.* 1925. Feb. 15. Vol. 5. No. 2. p. 44.]

As a result of a study of the action of immune serum on guineapigs infected with *Leptospira icterohaemorrhagiae*, the author finds that it is necessary to administer the serum before marked symptoms appear if a protective action is to be obtained.

E. H.

VANNI (Vittorio). **Le alterazioni epatiche nella spirochetosi ittero-emorragica.** [Hepatic Changes after Infection with *Spirochaeta ictero-haemorrhagiae.*]—*Riforma Med.* 1925. Mar. 16. Vol. 41. No. 11. pp. 244–245. With 2 text figs. [5 refs.]

From a study of the liver of two human cases of Weil's disease and about 100 guineapigs experimentally infected, the author finds that in the periphery of the lobules there occur small nodules composed mainly of lymphocytes. Numerous spirochaetes were present in these regions, but were absent elsewhere. The only other changes were those characteristic of acute inflammation, such as congestion and cloudy swelling. These nodules are considered to be peculiar to infectious jaundice, since they differ in their cellular constitution from other conditions in which focal necrosis of the liver occurs, such as syphilis, miliary tuberculosis, typhoid, etc. [see paper by CASTILLO, *ante*, p. 184 .

E. H.

SHIGA (Akira). **Untersuchungen ueber die Beziehungen der Wasserspirochäte** (*Spirochaeta pseudoicterogenes* **Uhlenhuth u. Zuelzer) zu dem Erreger der Weilschen Krankheit** (*Spirochaeta icterogenes* **Uhlenhuth u. Fromme s.** *Spirochaeta icterohaemorrhagiae* **Inada u. Ido.**). [Researches on the Relationship between the Water Spirochaete (*S. pseudo-icterogenes*) and the Causative Organism of Weil's Disease (*S. icterogenes* or *S. ictero-haemorrhagiae*).]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1924. June 25. Vol. 40. No. 1/2. pp. 148–171. [34 refs.]

The paper describes certain differences between the spirochaete of Weil's disease and the morphologically identical forms found in water. It is noted that the water spirochaete is much more resistant to the action of metals than *S. icterogenes*, and the author reproduces a series of tables illustrating the respective resistances of the two varieties to copper, lead, iron, brass and mercury. In their reaction to trypoflavin, argoflavin, rivanol, optochin, chloramin, glawelin and vuzin, there was no marked difference between the two. When exposed to ultra-violet rays the water spirochaete was much more resistant, as tested by the subsequent growth of the organisms in diluted rabbit serum medium. *S. icterogenes* will only continue to grow in culture media containing 0·85 per cent. sodium chloride, whilst *S. pseudo-icterogenes* will grow in media containing 1·2 per cent. The gradual replacement of the serum in the diluted serum media stops the growth of both spirochaetes, but *S. pseudo-icterogenes* will continue to grow in milk diluted with water. By using diluted immune sera as culture media it was found that this prevented the growth of the homologous spirochaetes only. Similarly specific agglutination with immune sera was obtained.

E. H.

CARBO-NOBOA (J. M.). **[Primer Caso de Leptospirosis Icterohemorragica en el Ecuador.]**—*An. Soc. Méd.-Quir. del Guayas.* Guayaquil. 1924. Apr. Vol. 4. pp. 97–111. With 1 microphotograph. [Summarized in *Bull. Inst. Pasteur.* 1924. Nov. 30. Vol. 22. No. 22. p. 898.]

The first record of *Leptospira ictero-haemorrhagiae* occurring in Ecuador. The spirochaete was obtained by preserving the citrated blood of the patient, mixed with Noguchi's medium, for a period of 12 days, and then inoculating into guineapigs, when the organism was found in sections of the kidney.

E. H.

i. Kohshina (Yoshimori). [**A Contribution to the Per Oral Infection of** *Spirochetosis Ictero-hemorrhagiae.*]—*Tokyo Igakkwai Zasshi* (*Jl. Tokyo Med. Soc.*). 1924. June. Vol. 38. No. 6. [Summarized in *Japan Med. World.* 1925. Jan. 15. Vol. 5. No. 1. p. 17.]

ii. Kachi (Yoshiwo). [**Chemical Studies on the Blood of** *Spirochetosis Ictero-hemorrhagica.*]—*Ibid.* 1924. Aug. Vol. 38. No. 8. [Summarized in *Ibid.* p. 17.]

i. By feeding guineapigs with cultures of *Spirochaeta ictero-haemorrhagiae,* a certain proportion of them became infected, as many as 50 per cent. when the animals were fasting.

ii. A marked increase was observed in the nitrogen residue contents of the blood, during the course of infection with infective jaundice. The concentration was much higher than any observed in other diseases, with the exception of uraemia.

E. H.

Bonne (C.). **Comparaison du spirochète des rats d'Amsterdam avec une souche française de spirochétose ictéro-hémorragique.**—*Ann. Inst. Pasteur.* 1925. Jan. Vol. 39. No. 1. pp. 35–44.

A strain of Leptospira isolated from rats in Amsterdam has been subjected to various serological and other tests and has been found to be practically identical with the strain used in Pettit's laboratory for the diagnosis of Weil's disease.

E. H.

YELLOW FEVER.

CRAN (James). **The Results of the Noguchi Treatment of the Prophylactic Measures employed in the 1923* Yellow Fever Epidemic in Belize.** [British Honduras.]—*Jl. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 28. No. 2. pp. 26–29. Also in *Proc. Internat. Conference on Health Problems in Trop. America.* pp. 194–200. [United Fruit Company, Boston, Mass.]

An account of an outbreak of yellow fever occurring in Belize, in 1921, which is of interest because exact records were kept of the history of the epidemic. The outbreak occurred after the summer holidays in a large secondary college a mile from Belize, about half the pupils of which came from Salvador, Guatemala, Mexico and Honduras, and as yellow fever was known to have occurred in the first three countries within the past year, it is evident that an ambulatory case of the disease must have returned amongst the pupils.

A total of 17 cases occurred, and all received inoculations of Noguchi's serum; 4, who were already in their 4th to 6th day, died; of the remaining 13, all received the serum on the 1st or 2nd day of the disease, and only 1 died. Ten of the latter had previously been inoculated with Noguchi's vaccine, along with the other pupils, but developed the disease within 10 days of being vaccinated. The infection was stamped out by removing all the pupils to a locality where no stegomyia existed, and then destroying all mosquitoes in the buildings by intensive fumigation.

This outbreak later reached the town itself, and three persons became infected. Incidentally, two of these were whites, and the author remarks that it was a strange coincidence that they were the only whites who had not been vaccinated against the disease, whilst 100 or 200 who had been inoculated with Noguchi's vaccine, and were equally exposed, escaped infection.

A local fish, known as "*Billums,*" is now being largely used for destroying mosquito larvae, as it lives well in tanks, and two are said to be able to keep an ordinary tank free from mosquitoes.

[The evidence in support of the author's view that "Noguchi's vaccine is of value," is very unconvincing, considering the results obtained with the pupils, but the administration of Noguchi's serum in the early stages of the disease seems to be attended with success.]

E. Hindle.

DE CAMPOS (Geminiano). **A febre amarella em Caruarú.**—*Brazil-Medico.* 1924. May 17. Year 38. Vol. 1. No. 20. pp. 281–282.

Caruarú, Pernambuco State, is known as the "Children's Cemetery," and the author states that between 80 and 90 per cent. of them are attacked by yellow fever in some form, severe or mild, and of these about 40 per cent. die. The remainder grow up immune, so that "it is no exaggeration to say that 85–90 per cent. of those who have been born and brought up in Caruarú are immune owing to their having suffered from an attack of the disease in infancy."

H. Harold Scott.

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* An obvious misprint for 1921.

RIVAS (Pedro F.). **La profilaxis de la fiebre amarilla en Yucatan.**—*Rev. Med. de Yucatan.* 1924. June & Sept. Vol. 13. Nos. 2 & 3. pp. 25–36; 55–65. [6 refs.]

There are three main endemic foci of yellow fever in the Peninsula of Yucatan, namely, Mérida, Campeche, and El Carmen. For prevention the chief points to be attended to are, firstly, antimosquito-measures to be applied with special energy in the endemic foci; and, secondly, the use of Noguchi's vaccine with cultures of *L. icteroides.* The use of the anti-serum is also of value.

H. Harold Scott.

CORREIRA (Alberto Carlos Germano da Silva). **O problema da febre amarela em Angola e os seus climas maritimos.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.). 1923. Aug. No. 4. pp. 247–308. [12 refs.]

The history of yellow fever is first considered, dating back between 60 and 70 years; various towns are mentioned in detail, with certain meteorological conditions of each and tables giving the maximum, minimum and mean temperatures, the degrees of humidity, the atmospheric pressures and the prevailing winds for the past half century, correlating these as far as possible with the disease. The results hardly seem to jusitfy the enormous amount of work which the gathering together of these statistics must have entailed.

H. Harold Scott.

GAUTIER. **La fièvre jaune au Dahomey en avril et mai 1924.**—*Ann. de Méd. et de Pharm. Colon.* 1924. May-June-July-Aug. Vol. 22. No. 2. pp. 198-204.

A description of five cases of yellow fever at Bohicon and one at Guidah, all of which were fatal, and the prophylactic measures adopted to prevent the spread of the epidemic. It is noteworthy that the last case of yellow fever at Bohicon, previous to these, occurred in 1912.

E. H.

PERRÍN (Tomás G.). **La Leptospira de Noguchi.**—*Arch. Inst. Nac. Hig. Alfonso XIII.* 1923. Aug. Vol. 2. No. 2. pp. 1–17. With 12 figs on 6 plates.

A general account of our knowledge of *Leptospira icteroides*, including the author's own observations on the infection in the guineapig. The parasite has been found not only in the liver and kidney, but also in the dermis of the skin, the muscles (especially the cardiac), the supra-renal bodies, lungs, testes, walls of the blood-vessels, bladder gall-bladder, lymphatic glands, cerebral hemispheres and cerebellum.

E. H.

HOFFMANN (W. H.). **El liquido cefaloraquideo en la fiebre amarilla.** [The Cerebrospinal Fluid in Yellow Fever.]—*Sciencia Medica.* 1924. May 31. Vol. 2. No. 5. pp. 242–243.

Since *Spirochaeta pallida* and *Leptospira icterohaemorrhagiae* may invade the cerebrospinal fluid, so may the organism of yellow fever, especially as central lesions—congestion, haemorrhage, increase of

spinal fluid—have been recorded in this disease. The author, **therefore, advocates a more detailed clinical and experimental study of this secretion in cases of yellow fever and suggests that such may elucidate some of the symptoms, such as the vomiting, the slow pulse, hiccough, coma and convulsions.**

H. Harold Scott.

DIETERICH (Frederick H.). **The Filterability of** *Leptospira icteroides* **in Culture.**—*Amer. Jl. Trop. Med.* 1924. Nov. Vol. 4. No. 6. pp. 553–555. [7 refs.]

The author succeeded in filtering cultures of *Leptospira icteroides* that had been grown for eight weeks on Noguchi's semi-solid medium, a Berkefeld filter V being employed. Examination of the filtrate immediately after filtration showed no Leptospira, but many refractive granules, and inoculation into two guineapigs produced typical symptoms of yellow fever in each case. Cultures of the filtrate were made, but there was no visible evidence of growth, though on dark field examination three Leptospira were found in 12 preparations, and numerous refractive granules; the virulence of the cultures was proved by inoculation experiments.

These experiments furnish confirmatory evidence of the filterability of this organism, but whether in its spiral form or in a granular phase is not yet determined.

E. H.

i. HOFFMANN (W. H.). **Die pathologische Anatomie des Gelbfiebers.**—*Klin. Woch.* 1925. Apr. 2. Vol. 4. No. 14. pp. 632–638. With 2 text figs., and *Siglo Méd.* 1925. Apr. 11 & 18. Vol. 75. Nos. 3722 and 3723. pp. 361–364; 397–400. With 2 text figs.

ii. AGRAMONTE (Aristides). **Some Observations upon Yellow Fever Prophylaxis.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 201–208. [United Fruit Company, Boston, Mass.]

i. The subject matter of this paper has already been dealt with (this *Bulletin*, Vol. 22, p. 189).

ii. See this *Bulletin*, Vol. 22, p. 191.

E. H.

MULLER (Henry R.). **Histopathology and Hematology of Experimental Yellow Fever.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 180–193. [4 refs.] [United Fruit Company, Boston, Mass.]

NOGUCHI (Hideyo), MULLER (Henry R.), TORRES (Octavio), SILVA (Flaviano), MARTINS (Horacio), SANTOS (Alvaro Ribeirodos), VIANNA (Godofredo) & BIÃO (Mario). **Experimental Studies of Yellow Fever in Northern Brazil.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 169–179. [Numerous refs.] [United Fruit Company, Boston, Mass.]

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

(i) DRBOHLAV (Jaroslav). **[Demonstration of a Method of Cultivating** *Entamoeba histolytica.***]**—*Trans. Roy. Soc. Trop. Med. & Hyg.* (Proceedings of Laboratory Meeting, 20 Nov. 1924). 1924. Nov. & Dec. Vol. 18. Nos. 5 & 6. pp. 238–240. [Issued Feb. 1925.]

(ii) DRBOHLAV (Jaroslav). **Présentation d'amibes dysentériques en cultures.**—*Bull. Soc. Path. Exot.* 1925. (Séance du 11 fév.) Vol. 18. No. 2. pp. 121–122. [Issued March 1925.]

(iii) BOECK (William C.) & DRBOHLAV (Jaroslav). **The Cultivation of** *Endamoeba histolytica.*—*Proc. Nat. Acad. Sci.* (Washington). 1925. May 15. Vol. 11. No. 5. pp. 235–238. [3 refs.]

(iv) BOECK (William C.) & DRBOHLAV (Jaroslav). **The Cultivation of** *Endamoeba histolytica.*—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 371–407. With 4 plates. [11 refs.]

At the 20th annual meeting of the American Society of Tropical Medicine, held at Chicago last summer, an important communication was made by Dr. W. C. Boeck and Dr. J. J. Drbohlav. Their paper— read by the former on June 10th, 1924—was entitled " The cultivation of a pathogenic amoeba (*Entamoeba histolytica*) from a case of relapsed amoebic dysentery " ; but apart from brief mention in the published minutes of the meeting (*Amer. Journ. Trop. Med.* (1924), IV, 440), it did not appear in print. Later in the year the authors were able to extend their original observations, and a complete but belated account of their joint researches has just appeared for the first time (iv, above). Meantime, however, Dr. Drbohlav had returned to Europe, and demonstrated their methods and results at a meeting of the Royal Society of Tropical Medicine and Hygiene in London (November, 1924), and afterwards at a session of the Société de Pathologie Exotique in Paris (February, 1925). Brief accounts of both these demonstrations were subsequently published (i and ii, above) ; but although they are virtually " preliminary communications," they contain certain new observations not included in the original work. A preliminary account of this—the original joint observations made in America—was read at the Boston meeting of the National Academy of Sciences (U.S.A.) in November, 1924, but not published until May this year (iii). [By error it is stated in this paper (iii, p. 238) that the original cultures were kept in 1925—not 1924, which is the correct date.]

It seems advisable to record these particulars here, since the dates of reading and of ultimate publication of the several papers—taken in conjunction with their contents—may easily mislead present readers and future bibliographers unacquainted with the circumstances. Publication of the full memoir by both authors (iv) was unfortunately retarded, and as a consequence this work now makes its appearance long after its contents have become widely known. Indeed, it is common knowledge that the original results—first made public, though not printed, over a year ago—have meanwhile been confirmed and amplified by many other workers in England, France, and America. For the benefit of interested workers who have not ready access to current periodicals, it may be added that no paper on this subject has been published in the *Amer. Journ. Trop. Med.*—as advertised in the programme of the Chicago meeting : that the paper stated (in ii) to be about to appear in the *Journ. Exp. Med.* is really No. iv (above) and has not been published in that journal : and that a further paper promised (in ii) for the March number of the *Ann. de Parasitol.* this year was not so issued.

As will be seen in the publications cited, Boeck and Drbohlav obtained their original cultures of *E. histolytica* accidentally, using a medium devised by the former for the cultivation of intestinal flagellates. Afterwards various modifications of this medium—and also others—were tried. The procedure finally adopted and recommended is of the simplest, and consists essentially in the employment of a medium which is half liquid and half solid. The solid is distributed in test-tubes in the form or ordinary bacteriological slants, and the liquid is then added so as to cover the solid. The latter may consist of coagulated whole egg (4 eggs thoroughly emulsified in 50 cc. of Locke's solution—distributed, sloped, and set by heat in the usual way), or of Dorset's egg-medium, or of ordinary bacteriological blood-agar. The liquid constituent may be composed of inactivated serum (human or horse) diluted with Locke's solution (1 : 8), or egg-albumin diluted with Locke's or Ringer's solution (1 per cent. crystallized egg-albumin, or the white of one egg to the litre). The solid, after tubing, is sterilized in the autoclave, and the liquid—added afterwards—by filtration through a Berkefeld candle. The initial reaction of such media was found to vary from pH=7·2 to 7·8 ; and as this is the optimum for the growth of the amoebae, it is unnecessary to adjust it.

Material containing active forms of *E. histolytica* (from stools, etc.) is inoculated into the sterile tubes of medium—previously warmed to 37°C.—with a capillary pipette. It should be delivered into the bottom of the liquid, where the greatest growth of amoebae occurs at the interface between the solid and liquid. The cultures are then incubated aerobically at 37°C.

In such cultures the maximum growth of amoebae is usually seen on the second day of incubation. (A small drop of the sediment or surface growth at the bottom of the tube is removed with a sterile pipette and examined under the microscope.) Thereafter they diminish in number, and usually die out on the fifth or sixth day. In order to preserve the strain it is therefore necessary to inoculate subcultures (made in the same way as the initial culture) every second, third, or fourth day. In preparing and handling the cultures, the usual bacteriological precautions must be observed in order to prevent contamination.

Cultures of *E. histolytica* made in this manner are never pure, but contain a variety of bacteria and other organisms introduced with the initial inoculum. (Attempts to obtain pure cultures failed.) The medium was found suitable for cultivating not only *E. histolytica* but also *E. gingivalis* (ii) and several intestinal flagellates (*Trichomonas* and *Chilomastix* of man and the fowl, etc.). It is also very favourable for the growth of *Blastocystis*, which may overgrow the protozoa and hamper or prevent their cultivation. *Entamoeba coli* and *Endolimax nana* lived for three days in initial cultures, but the authors were unable to obtain subcultures of these species (iv).

It is a remarkable fact that *E. histolytica*, when cultivated by the methods described, feeds not upon living tissues or their products—as it invariably does in the lesions in man or the cat—but upon bacteria. In such cultures it adopts the food-habits characteristic of *E. coli,* and is thus able to live and multiply in a medium which at first sight would appear totally unsuitable for its maintenance. When red blood-corpuscles are introduced into the medium, however, the amoebae readily ingest them. The bearing of these observations—which are easily verifiable and undoubtedly correct—on the normal life and development of *E. histolytica* is not yet clear, and can only be shown by further observations and experiments.

Using the methods indicated, the authors were able to isolate and cultivate two strains of *E. histolytica* from the stools of two different patients, whose clinical histories are briefly recorded (in iv). The first (" K " strain) was kept going through 152 subcultures from February 18 till October 25 (1924); the second (" E ") through 47 subcultures from July 2 till October 1 (1924). Both strains were in the end lost accidentally. (Other similar strains were successfully isolated and maintained by Drbohlav in London (see i) and in Paris (see ii) subsequently.) The amoebae remained throughout morphologically identical with those in the patients' stools, and convincing evidence is presented (in iv) that the organisms so cultivated were really *E. histolytica*. The infections of both the original patients (" K " and " E ") were apparently eradicated by treatment with emetine: the amoebae in their stools were morphologically typical of this species and characteristically pathogenic for kittens when inoculated intrarectally—producing typical amoebic dysentery: and the cultures when similarly inoculated produced the same results. One kitten (No. 102) inoculated with the faeces of patient " K " developed a typical amoebic abscess of the liver: another (No. 120), inoculated with cultures of the " K " strain after about 5 months of cultivation, also got a liver-abscess. The infections produced by inoculating cultures into kittens were readily transmitted to other kittens in the usual way, and from kittens so infected the amoebae were repeatedly recovered in culture. In short, the evidence advanced to show that the authors have succeeded in cultivating *E. histolytica* is adequate and conclusive.

It was found that *E. histolytica*, when cultivated in the way described, did not lose its infectivity or pathogenicity for kittens. " The virulence of the amoebae was not influenced by prolonged cultivation." (The last wholly satisfactory experiment performed in this connexion is that on kitten No. 120, which was infected with " K " cultures—generation not recorded—about 5 months after the strain was isolated.) The amoebae multiplied in the cultures by binary fission in the usual way, but they did not encyst. Encystation was observed in only a single culture of the " E " strain—20 days after isolation (generation not stated)—and only 6 cysts were found. Neither the addition of skatol to the cultures, nor placing them in the ice-box, caused the amoebae to encyst—as related by CUTLER [see this *Bulletin*, Vol. 14, p. 95]: nor did the authors succeed in cultivating *E. histolytica* by his methods. [This *Bulletin*, Vol. 12, p. 292.] They say, however, that their experiments " confirm " his work " with respect to the cultivability of *E. histolytica* "—a statement which appears equally applicable to the work of everybody else who has previously claimed to have cultivated this organism. Curiously enough, the authors make no reference to the antecedent observations of BARRET and SMITH, who undoubtedly succeeded in cultivating another intestinal *Entamoeba*—*E. barreti*, from a turtle. [See *Amer. Journ. Hyg.* (1924), iv. 155: also TALIAFERRO and HOLMES, *ibid.* p. 160.]

There can be no doubt that these papers—the outcome of a felicitous collaboration between an American and a Czech, in the Medical School of Harvard—constitute a notable advance in the study of intestinal amoebae. Previous workers may possibly have succeeded in cultivating *E. histolytica*; but the discovery of the simple and certain methods here described has, for the first time, opened up many possible lines of research which appeared hitherto unattemptable. The methods described are not perfect, and much still remains to be done for their improvement; but it is beyond dispute that the work of Boeck and Drbohlav has already attained a stage from which immediate further advancement of our knowledge of the intestinal amoebae is assured.

Clifford Dobell.

CLARK (Herbert C.). **The Distribution and Complications of Amoebic Lesions found in 186 Postmortem Examinations.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 365–379. With 2 figs. [3 refs.] [United Fruit Company, Boston, Mass.], and *Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 157–171. With 2 text figs. [3 refs.]

The period of time covered by these records is from 1905 to 1923 inclusive. The incidence of amoebic abscess of the liver, amoebic appendicitis, rupture of abscesses and intestinal ulcers, peritonitis, etc., warrant attention. The proportion of races in the autopsies is as follows: West Indian negroes, 133; Latin-Americans, 31; foreign whites, 22. There were 172 males and 14 females. Most cases occurred in the 3rd, 4th and 5th decades.

Causes of death.

Amoebic ulcerative colitis	64
Amoebic dysentery with liver abscess	80
Amoebic abscess of liver with insignificant intestinal lesions	15
Other causes	27

Intestinal Distribution of Lesions.

Entire colon involved	55
Entire colon and ileo-caecal valve	3
Entire colon and appendix	48
Entire colon, appendix and ileo-caecal valve	7
Caecum and ascending colon	24
Caecum, ascending colon and appendix	9
Caecum, rectum and sigmoid	8
Caecum, rectum, sigmoid and appendix	6
No primary lesion in intestine or appendix	7
Scar or almost healed lesions in colon	3
Appendix, caecum, splenic flexure and rectum	2
Rectum	2
Rectum and sigmoid	2
Appendix, caecum, both flexures and rectum	1
Rectum, sigmoid and splenic flexure	1
Appendix, caecum and splenic flexure	1
Caecum, ascending and transverse colons	1
Appendix, caecum, ascending and transverse colons	1
Rectum, sigmoid and descending colon	1
Appendix, caecum, ascending and transverse colons and hepatic flexure	1
Rectum, sigmoid, descending and transverse colons, both flexures	1

The incidence in the caecum, ascending colon, rectum, sigmoid flexure and appendix is to be noted. The ulcers were scattered throughout the colon in 60·7 per cent., in certain regions in 33·8 per cent., and there were 10 cases (5·3 per cent.) in which no ulcers or only scars were found. The dependent portions represent the regions where the greatest stasis exists in the colon, affording a favourite resting place for the development of the entamoeba.

Complications associated with the intestinal ulcers.

Perforations of ulcers in the colon, site not stated ...	4
„ „ „ caecum, site not stated...	3
„ „ „ appendix...	3
„ „ „ rectum and sigmoid ...	3
„ „ „ sigmoid and appendix ...	1
„ „ „ splenic flexure	1
„ „ „ sigmoid	1
„ „ „ caecum and rectum ...	1
„ „ „ sigmoid and splenic flexure with appendix abscess	1
Appendix abscess	1
Peri-rectal abscesses	2
Faecal fistula	1
Amoebic fistula-in-ano	1

Thus, in 10·7 per cent. of cases, single or multiple perforation of amoebic intestinal ulcers had occurred and local peritonitis or general peritonitis resulted. During the 12 years the author examined six appendices in which extensive amoebic lesions were found.

In the series there were 95 cases (51 per cent.) which showed some involvement of the liver. Solitary abscesses had developed in 40 cases (42 per cent.) and multiple abscesses in 55 (58 per cent.). Amoebic ulceration of the colon, localized or general, was associated in 85 cases; 3 revealed scars in the colon, and 7 no past history of amoebiasis.

Position incidence of liver abscesses.

Location.	*Number of Cases.*	*Percentage of Cases.*
Right lobe	53	55·7
Right and left lobes ...	16	16·8
All lobes	15	15·7
Left lobe	8	8·4
Location not stated... ...	2	2·1
Right and Quadrate lobes ...	1	1·05

Complications of Amoebic Liver Abscesses.

Nature of Complication.	*Number of Times.*
Rupture of abscess into the peritoneal cavity ...	9
Rupture of abscess into the lesser sac	5
Abscess perforating right dome of diaphragm ...	8
Right sub-diaphragmatic abscess	3
Abscess perforating diaphragm and body wall ...	1
Perforating wall of stomach	1
Rupture of a surgically-drained abscess into the vena cava	1
Rupture of old operation scar for a former drainage of liver abscess	1
Abscess pressure causing obstruction of duodenum and stomach	1
Abscess pressure causing obliteration of gall-bladder	1
Peritonitis, from escaped liver-abscess contents ...	17

Many so-called large single abscesses are not a solitary lesion, since a zone occurs round the large lesion composed of very small abscesses; when scattered throughout all parts of the liver, the abscesses vary from the size of a pea to that of a tennis ball. Sometimes an amoebic lesion of the liver will consist of a large, dark, haemorrhagic area of necrotic tissue. The average size of a large solitary abscess, of a kind which would cause clinical symptoms and attract attention, is about that of an orange and the liver weight will be about 2,600 grammes. Five cases were seen in which healing of small abscesses, subsequent to the drainage of a large one, were seen. There was evidence of encapsulation.

Other forms of Secondary Amoebiasis encountered.

Peritonitis secondary to unruptured ulcers	19
Amoebic abscess of lung	6
Amoebic abscess of brain	4
Caecostomy wounds showing amoebic invasion ...	3
Amoebic thrombosis of vena cava and left renal vein	1
Amoebic thrombosis of portal radicle	1

There was one abscess of the lung without any perforation of the diaphragm. In all but one the brain abscesses were associated with a similar condition of the liver which had been drained by the surgeon. Caecostomy wounds through which irrigation treatments are given may become the seat of secondary amoebic invasion; a large zone round the opening becomes swollen, oedematous, and later suppurates; the entamoebae are abundant in the subcutaneous tissues.

In reviewing the records a very sudden decline in the number of cases of amoebiasis has been noted since the year 1914. During the years 1920-1923 only 3 came to autopsy out of 800 autopsies performed. Prior to the installation of new water systems there were 4,000 autopsies, which yielded 170 cases of amoebiasis (4·25 per cent.); after this there were only 2,800 autopsies, which yielded 16 cases, or 0·57 per cent.

P. H. Manson-Bahr.

Runyan (R. W.) & Herrick (A. B.). **Surgical Complications and Treatment of Intestinal Amoebiasis.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 336–345. [1 ref.] [United Fruit Company, Boston, Mass.] and *Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 137–147. [1 ref.]

The complications requiring surgical intervention during the course of amoebic dysentery either arise from the direct action of the parasites or are of purely mechanical origin. A number of latent cases present distinct localizing symptoms in the region of the appendix. Symptoms vary from mere discomfort to typical appendicular colic. The clinical symptoms of alternating attacks of diarrhoea and constipation with a tentative diagnosis of appendicitis are quite characteristic. Before this symptom-complex was understood, many appendices were surgically removed, but since then the tendency has been to be ultra-conservative. Reinfection of the bowel from the appendix is possible. All cases of apparently definite chronic appendicitis with latent intestinal amoebiasis are advised to have appendectomy, to be followed in ten days time by the routine medical treatment. After a gridiron operation the patients are allowed to get out of bed as soon as they desire, and are usually up in a chair by 4th or 5th day. Stitches are removed from the 7th to the 10th, after which treatment of their infection is begun. No patient has so far developed hepatitis or liver abscess.

Four cases of massive type of ulceration of the caecum have been encountered. A condition simulating a tumour is produced, and is caused by the enormous thickening of the bowel wall, which may affect not only the caecum, but the terminal ileum. The first case was thought to be a tumour of the kidney, the second carcinoma of the caecum, but the last two cases were correctly diagnosed by finding the amoebae in the faeces, previous to operation. In every instance it was found necessary to excise the caecum and to perform end-to-end anastomosis. Three out of the four patients recovered. The operation is necessarily a serious one, but it does not seem possible to evade it. The involvement of the *small* intestine is probably due to an extension of the process from the caecum, due to the almost complete obstruction and consequent damming up of the intestinal contents. Intestinal haemorrhage is another uncommon condition. Cases of very severe colitis, passing 20-30 bloody stools daily, with emaciation and dehydration are treated by continual irrigation of the large bowel following appendicostomy, or, more frequently, caecostomy.

Regarding liver abscess the authors do not consider the aspiration method offers any improvement over simple incision and drainage. During the last six years the authors have operated upon only 21 abscesses, of which one has died. Two cases of amoebic abscesses of the brain have been seen. Amoebae will occasionally destroy large sections of the abdominal or thoracic wall. Two such cases have followed caecostomy and one a trans-thoracic opening of an hepatic abscess ; these were, however, previous to the introduction of emetine.

P. H. M-B.

KOFOID (Charles A.), BOYERS (Luther M.) & SWEZY (Oliver). **Systemic Infections by** *Endamoeba dysenteriae.—Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 381–399. [35 refs.] [United Fruit Company, Boston, Mass.]

" *Endamoeba dysenteriae* " tends to spread in the margins of ulcers of the colon into the capillaries and smaller veins and thence may make its way into the liver, or through the heart to the lung and systemic circulation. Liver, lung and brain abscesses should thus be interpreted as examples of haematogenous invasions by way of the blood-stream. Infection of the bone marrow will result by this route. Whether or not the infection of the lymphatic glands occurs by the lymph stream or arterial system is unknown. Pathological conditions of the iris and retina and of the thyroid may be due to this organism, while the occurrence of amoebae in the testes, semen, spleen and skin ulcers afford evidence of its generalized distribution. The importance of continued clinical study in correlation with examination of tissues at autopsy and at surgical operations in cases of amoebiasis is most evident.

This paper gives details of the occurrence of " *Endamoeba dysenteriae* " in bone marrow, in the glands of Hodgkin's disease, and in the skin, all of which has been already reviewed in the *Bulletin* (see this *Bulletin,* Vol. 19, pp. 684 and 685, and Vol. 20, pp. 713 and 1002).

P. H. M-B.

VALLARINO (J. J.). **Preliminary Report on the Value of the Roentgen Ray in estimating the Extent of Amebic Infection of the Large Intestine.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 357–364. With 6 figs. United Fruit Company, Boston, Mass.] and *Amer. Jl. Trop. Med.* **1925.** Mar. Vol. 5. No. 2. pp. 149–156. With 6 text figs.

Routine X-ray barium meal examinations have been made in all cases of intestinal amoebiasis. The findings have been very suggestive. Firstly, defects were seen in all cases of amoebic infection due to *E. histolytica* with definite symptoms, whether mild or severe. Secondly, the X-ray findings correspond very well with the clinical phenomena in that the filling defects correspond with the points of tenderness in the abdomen, and thus determine the extent of the intestinal lesions and give clinicians data which could not otherwise be obtained. In the majority of the cases the bowel loses its normal contour and a mottled area is found instead. The lesions are usually situated in the caecum and ascending colon as far as the hepatic flexure; next in frequency in the sigmoid; much less often in the transverse and descending colon. Better information is obtained by giving the opaque substance by the mouth than by administration of barium enemata; the reason being that by the time it reaches the large bowel the barium has adapted itself to its surroundings and has followed the channel which offers least resistance. When given by enema the bowel is overfilled and becomes abnormally distended, so that the ulcers and pockets have not sufficient time to fill properly. The clinical symptoms do not always conform to the X-ray findings, for sometimes a more extensive ulceration is found than the clinical symptoms would suggest possible.

P. H. M-B.

GARIN (Ch.) & LÉPINE (Pierre R.). **The Acclimatization and the Frequency of Amebiasis in the Lyon Region in France. Two New Arsenical Compounds against Amebiasis: Stovarsol and Acetylarsan.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 309–316. [United Fruit Company, Boston, Mass.]

As far back as 1905 DOPTER had shown that amoebic infection was prevalent in certain parts of France. During the world war facilities for its introduction by the colonial troops were considerably increased, particularly in Lyons, where the disease is now by no means rare. It is certain that proper restrictions against possible carriers of amoebae at the frontiers and ports of entry will greatly diminish and possibly suppress amoebiasis in France. The results of enquiry into 208 cases of amoebiasis are given: 191 occurred in males; 16 in females; one was seen in a child. Forty (35 male and 5 female) were of exotic origin; of these 21 had come more or less into direct contact with colonial troops during the war; in 12 the origin was undetermined. Infection of women by their husbands was recorded in 10 per cent. of cases. Interhuman infection thus produced 72·5 per cent. of the cases.

Most of the patients had chronic diarrhoea and recurrent colitis with dysenteric periods. In long standing cases the authors think that injury to the adrenal glands and to the solar plexus results; in

44 instances there was evidence, in the low blood pressure, emaciation, pallor and pigmented patches, that these organs were affected.

Amoebiasis associated with Lamblia or Trichomonas is specially resistant to emetine; Stovarsol and acetylarsan appear to be effective against Lamblia. Stovarsol is given in pill form, 25 cgm., and may be dissolved in water; it may be associated with emetine, when the whole treatment should last four weeks. When it is used alone 75 cgm. is given daily for a week, intermitted for a week, and then resumed. The after treatment consists of stovarsol every other day for 1 to 2 months. The amoebae disappear in 4 days, the cysts in 8. Acetylarsan has been employed by Garin without the use of emetine in cases of hepatitis, the dose recommended being 75 cgm. once a week for four weeks. Acetylarsan may be combined with emetine. Lamblia and Trichomonas appear to be susceptible to the drug.

P. H. M-B.

ROGERS (Leonard). **The Prevention and Treatment of Amoebic Hepatitis and Liver-Abscess.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 346–355. [United Fruit Company, Boston, Mass.]

Records improvements in the diagnosis and treatment of amoebic hepatitis and liver abscess which have resulted from the author's researches and the introduction of emetine therapy. The statistics given and the authorities quoted have been reviewed in previous numbers of this *Bulletin.*

P. H. M-B.

IZAR (Guido). **Amebiasi polmonare.**—*Riforma Med.* 1925. Apr. 20. Vol. 41. No. 16. pp. 361–365.

This is an interesting account of infection of the lung with *E. histolytica.* Distinction is drawn between pulmonary amoebiasis secondary to or concomitant with hepatic or intestinal infection, and that arising primarily and exclusively in the lung. From a diagnostic and therapeutic point of view differences are stated to exist according to whether the lung focus is closed, *i.e.*, in the tissue itself, or open, *i.e.*, communicating with the outer air. If the sputum is mucopurulent and blood-stained, but not fetid, the condition is mainly, if not entirely, protozoal; when it becomes purulent and loses the reddish tinge, bacteria will be found to increase and amoebae relatively diminish; when, finally, it becomes fetid, liquid, more copious and greenish, bacteria predominate and amoebae may no longer be found. The author discusses the mode of infection of the lung and favours the haematogenous route rather than the lymphatic, or that by continuity from the liver through the diaphragm and pleura. He next describes the pathological anatomy and clinical course, and sums up the main results by postulating three forms :- (1) The closed form of pulmonary amoebiasis in which the amoeba is alone the cause, with resultant infiltration and necrosis of the lung parenchyma. This yields to emetine with or without arsenic; (2) The open pulmonary abscess due to the amoebae and pyogenic organisms; this requires serum or vaccine therapy, or medical treatment, in addition to emetine, and may need surgical interference; (3) The open form with ulcero-phlegmonous complications in which pyogenic organisms only can be found, the amoebae having disappeared. In this vaccines and serum therapy may be employed, but operative measures are practically a necessity.

H. Harold Scott.

YALOUSSIS (Evan). **Sur quelques cas de "Bronchoamibiase de Petzetakis."**—*Rev. Méd. et Hyg. Trop.* 1925. May-June. Vol. 17. No. 3. pp. 131–135. [11 refs.]

Three cases of bronchoamoebiasis have recently been studied from a radiographic point of view. Two of them had already been diagnosed and treated as pulmonary tuberculosis. The chief distinguishing points in the radiograph would appear to be a density at the hilum and the appearance of bronchoectatic cavities in the lobules. These three cases were primarily diagnosed by the discovery of amoebae in the sputum, and by their remarkable response to emetine therapy.

P. H. M-B.

CAUSSADE (G.) & TARDIEU (André). **Abcès amibien gangreneux du poumon droit indépendant d'un abcès amibien latent du foie chez un ancien colonial.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Mar. 12. Year 41. 3rd Ser. Vol. 49. No. 9. pp. 363–370. [15 refs.]

The paper concerns a case of solitary amoebic abscess of the lower lobe of the right lung which had taken apparently seven, or it may be ten, years to develop and at last made itself evident by symptoms of pulmonary gangrene. It was quite independent of a similar abscess in the liver, which had given rise to no distinctive symptoms during life. After death, histological examination revealed a few amoebae in portions of the tissue which had escaped the gangrenous process. Other points of importance were the presence of numerous spirochetes and fusiform bacilli in the abscess cavity, and the development of a simple pneumothorax in the vicinity of the gangrenous focus.

The patient was a veteran colonial soldier who had served in Tonkin and had numerous attacks of amoebic dysentery. For 18 years he had suffered from periodic recurrence of fever with expectorations which were not foetid in character. Symptoms of gangrene of the lung developed suddenly in June, 1920. At autopsy, a well-defined hepatic abscess the size of an orange was found in the liver. At the base of the right lung a spherical abscess occupied the whole of the lower lobe; buried deep in the parenchyma it contained foetid green-coloured exudate. No communication through the diaphragm could be verified. The sequence of events appears to have been: amoebic dysentery, hepatic abscess, secondary pulmonary abscess, pulmonary gangrene, and pneumothorax.

P. H. M-B.

TANGANYIKA TERRITORY. ANNUAL MEDICAL REPORT FOR THE YEAR ENDING DECEMBER 31ST, 1923. pp. 182–183.—**Liver Abscess in a Native of Uganda: Operation, Recovery,** by C. F. SHELTON.

A clinical record of a case of liver abscess in a Uganda native. Two full courses of emetine injections were given and were followed by a striking improvement in the condition of the patient. Eventually, however, open operation with the insertion of a drainage-tube had to be resorted to, and, subsequently, freer exit for the pus by means of Manson's trocar; some 75 oz. of pus were evacuated altogether. The abscess had caused very considerable enlargement of the liver both upward and downward, with displacement of the heart outside the nipple line. The author is at a loss to explain the apparent efficacy of the third course of emetine subsequent to the second operation, for the first two courses of 10 gr. each had signally failed to prevent the reaccumulation of pus. 30 grains of emetine were administered altogether without the supervention of any recognizable toxic symptoms.

P. H. M-B.

D'AMATO (H. J.) & GONZÁLEZ (J. Ortuño). **Una forma poco común de absceso hepático amebiano.**—*Semana Méd.* 1925. Jan. 15. Year 32. No. 3. (1618). pp. 117–122. [18 refs.]

The authors describe most minutely a case of abscess of the liver. There was pain, and all the usual physical signs, but no rise of temperature, and no polynucleosis but rapidly progressing anaemia. Operation was undertaken, and a large amount of chocolate-coloured pus removed. The absence of fever is accounted for by the fact that the abscess was of old standing and absorption of toxins slight or wanting, and later, when there was rapid extension of the abscess, the temperature remained normal "because there was no fresh infection." The absence of increase of polymorphonuclears is ascribed to the abscess being due to amoebic infection without accompanying bacillary action. The anaemia does not seem to be adequately explained in the absence of toxic absorption. The Wassermann reaction was negative, "a fact of no importance as the signs of hereditary syphilis were present." The authors sum up by saying that in a subject of hereditary syphilis an amoebic abscess of the liver may become acute, with the production of intense anaemia, but without rise of temperature or increase of the polymorphonuclears.

H. Harold Scott.

MCGLANNAN (Alexius). **Amebic Abscess of the Liver. Report of a Case complicated by Subphrenic Abscess.**—*Jl. Amer. Med. Assoc.* 1925. June 27. Vol. 84. No. 26. pp. 1976–1978. [9 refs.]

The important features in this case were : The occurrence of an amoebic liver abscess in a French sailor who had apparently not been in the tropics, and the difficulty experienced in finding amoebae in the aspirated pus. The organisms did not become apparent until the wall of the abscess was scraped on the 24th day after the operation, and after frequent irrigation with quinine solution.

After the injection of emetine into the abscess cavity and the general injection of the same drug, great improvement in the clinical condition of the patient was noted. Radiography distinguishes a liver abscess from one of subphrenic origin. Emphasis is laid upon the occurrence of an abscess of such a large size in one who had never suffered from dysentery.

P. H. M-B.

BABLET (Jean). **Lésions histologiques dans un cas d'hépatite amibienne.**—*Arch. Inst. Pasteur d'Indochine.* 1925. Apr. No. 1. pp. 38–41. With 7 figs. on 3 plates.

A description of the pathology of a case of amoebic hepatitis which developed with great rapidity in an Annamite. At autopsy fluctuating abscesses the size of small hazelnuts were scattered throughout the liver. Microscopic examination of the necrotic areas (illustrated in 3 excellent plates) show an almost complete absence of leucocytic infiltration. At the margins of the necrotic zone indications of a fibrous capsule can be made out. The amoebae themselves are present in large numbers in curiously conscribed collections, but are only to be seen in sparse numbers in the centre of the necrotic tissue itself. The parasites have large well-marked nuclei and vacuolated protoplasm. The remainder of the paper concerns itself with theoretical considerations upon the entry of the entamoebae into the portal system and its consequent spread throughout the liver.

P. H. M-B.

FRANCHINI (Giuseppe). **Su di due casi di cistite amebica.**—*Pathologica.* 1925. May 15. Vol. 17. No. 396. pp. 271-273. With 1 text fig. [2 refs.]

The first case is that of a woman of 28 years who for three years had had dysenteric symptoms and for two years had at intervals passed blood-tinged, turbid urine, in which amoebae resembling *E. histolytica* were found; the condition, both intestinal and urinary, cleared up with emetine injections, but relapsed. The second was a man, aged 43 years, who showed no intestinal symptoms, though a few amoebae were found in his stools together with Giardia and its cysts and Blastocystis. The urine showed the same features as in the other case. The author mentions the possibility of the urine of the first patient being contaminated by the entamoeba from the bowel, but in the second this was definitely excluded.

H. Harold Scott.

PETZETAKIS. **A propos des amibes rencontrées dans les cystites amibiennes. Présentation des microphotographies des amibes.**—*Rev. Méd. et Hyg. Trop.* 1925. May-June. Vol. 17. No. 3. pp. 141-146. With 3 text figs. [11 refs.]

The author describes the amoeba which he has found in cases of pyocystitis under the name of "Entamoeba polymorpha." It varies in size from 15-45 centimetres (?); its movements are usually very active, and, as a rule, it ingests red blood corpuscles. The staining of these organisms is more difficult than of those present in the stool; sometimes they possess two, or even three, nuclei.

[The paper is illustrated by three microphotographs, the last of which is said to portray an Entamoeba as it occurs in dysenteric faeces. In each case the organisms are in the quiescent and circular stage; and they by no means convince the sceptical observer.]

P. H. M-B.

PETZETAKIS & PETRIDIS (G.). **Bilharziose et amibiase urinaire.**—*Rev. Méd. et Hyg. Trop.* 1925. Jan.-Feb. Vol. 17. No. 1. pp. 23-25. [3 refs.]

Case of a man of 25 years who had suffered for two years from haematuria and a cough with vague thoracic pains and slight mucopurulent expectoration. Examination of sputum and of urine revealed living amoebae, and in the latter a few ova of *Schistosoma haematobium.* The amoeba was 15-20 mm. in diameter with clear differentiation of ecto- and endoplasm, and several contained erythrocytes. There were no amoebae in the faeces. They disappeared after administration of emetine, though the bilharzia ova persisted.

H. Harold Scott.

DEGORGE (A.). **Appendice ulcéré et rempli de pus dans un cas de dysenterie amibienne.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1924. Apr. Vol. 2. No. 4. pp. 74–76. [1 ref.]

The author describes an appendix removed at operation from a case of amoebic dysentery. It was distended with thick yellow pus and contained an elliptical ulcer about 2 cm. in length; the mucous membrane was red and oedematous. No entamoebae were found in the pus. During the height of the illness which, unfortunately, proved fatal, the inflammation of the appendix had given rise to few, if any, signs.

P. H. M-B.

CHAUFFARD (A.) & CLÉMENT (Robert). **Grand abcès amibien du foie guéri par le traitement médical.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. May 7. Year 41. 3rd Ser. Vol. 49. No. 15. pp. 646–648. [2 refs.]

The authors relate the clinical history of a well-marked case of hepatic amoebiasis. The patient was admitted to hospital in February, 1925, with a much enlarged liver (measuring 21 cm. in nipple line), leucocytosis of 12,600, pyrexia, etc. Pleural and peritoneal friction sounds were present, and exploratory pleural puncture yielded a clear serous fluid containing endothelial and polymorphonuclear cells. Treatment consisted of daily emetine injections of 0·08 gm., followed by stovarsol 0·50 gm. daily. The patient made a complete clinical recovery. A point of interest in this case is the latency of the infection, for 12 years had elapsed since the dysenteric attack. They consider that a large abscess was certainly present, and that the pleuritic fluid was due to an amoebic pleurisy. The fact that the vertical diameter of the liver shrank from 21-14 cm. within 5 weeks is taken as proof of clinical cure. They think that in future surgical intervention in these cases will be the exception, and comment favourably upon the combined emetine and stovarsol treatment on which the patient gained 8 kilogrammes within a month.

P. H. M.-B.

RICCI (Angelo). **Contributo anatomo-patologico all'amebiasi intestinale ed epatica, curata con l'emetina.**—*Policlinico.* Sez. Prat. 1925. Mar. 23. Vol. 32. No. 12. pp. 414–420. With 2 figs. [53 refs.]

The case of a man with signs of hepatic abscess and with *E. histolytica* in the stools who was treated with emetine, 12 cgm. daily for five successive days; the course was repeated at intervals twice. Thirty-seven days afterwards the patient contracted lobar pneumonia and died. Post-mortem findings revealed an abscess at the upper part of the right lobe of the liver, the size of a lemon, with thick, fibrous walls, the fluid containing besides detritus and pus cells, crystals of haematoidin, cholesterin and Charcot-Leyden crystals, but no amoebae. MATTEI reported a similar case in 1917, and the author wonders whether the emetine, having been given in rather large doses and being eliminated by the respiratory tract, may not have paved the way for the fatal pneumonia.

H. Harold Scott.

DARGEIN & DORÉ (G. R.). **Amibiase pulmonaire gauche pure guérie par l'émétine et le stovarsol.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris* 1925. Apr. 9. Year 41. 3rd Ser. Vol. 49. No. 13. pp. 590–594.

The authors say that they cannot absolutely vouch for the amoebic origin of this case, as it was impossible to find the entamoebae in the sputum, but they point to the indisputable rapidity and efficacy of anti-amoebic treatment. The patient, a man 40 years of age, when first examined, had signs of congestion of both bases. Signs of consolidation then appeared at the left base with blood-stained expectoration, and moderate pyrexia. On aspiration clear fluid was removed from a dull area in Traube's space. After the expectoration of much chocolate-coloured sputum the empirical injection of emetine was commenced. After a total of 0·48 gm. expectoration ceased, and the pulmonary signs disappeared. A relapse took place eleven days afterwards, again with expectoration of fluid chocolate pus in which no evidence of destruction of liver cells was obtainable. Emetine therapy was once more followed by favourable results. The authors consider that the signs warranted the assumption of spontaneous abscess formation at the base of the left lung with signs of pulmonary congestion and pleurisy. No history of dysentery was obtainable, nor could direct evidence of amoebae be obtained, but these organisms are probably less numerous in pulmonary than in hepatic pus, where also they may be scarce enough. It is possible that this is an example of autochthonous amoebic abscess of the lung; hepatic abscesses of a similar nature have been previously reported from Toulon

P. H. M-B.

JOHNS (F. M.) & JAMISON (S. Chaille). **A Preliminary Note on the Treatment of Amebic Dysentery with Stovarsol.**—*New Orleans Med. & Surg. Jl.* 1925. May. Vol. 77. No. 11. pp. 469–471. [6 refs.]

The authors have treated 27 cases of amoebic dysentery, both chronic and severe, with stovarsol. The disease had lasted from a few weeks to 25 years. In all cases the diagnosis was confirmed by the discovery of entamoebae in the stools or in scrapings of the bowels made through the proctoscope. The stovarsol, administered in 0·25 gm. doses three times daily for one week, brought about complete subsidence of the symptoms on about the third or fourth day. In one case encysted entamoebae were found on the 15th day following stovarsol treatment, and in a second a clinical relapse took place on the 16th day. Three patients have remained well, and free from entamoebae up to the present time (99, 74 and 70 days) after one course of treatment; two of them received seven injections (1 gr.) of emetine. The remainder received a second course of stovarsol seven to ten days after the first, consisting of three 0·25 gm. tablets per day for 7 days or two tablets daily for 12 or 14 days.

Up to January 20, 1925, the authors have been able to follow 20 cases accurately controlled for a period of 55 days. Of these 16 have remained well and free from entamoebae, and 4 have relapsed, 3 in a clinical sense and 1 by passing cysts. It is hoped that when the tolerance of this drug is more accurately known, it can be given over longer periods with even better results.

In the discussion Dr. GESSNER described the occurrence of a measles-like rash after exhibition of the drug resembling the transient arsenical rash sometimes observed after the injection of salvarsan. Dr. LEVIN described a chronic case of intestinal amoebiasis in which apparent recovery took place on stovarsol, in 8 gr. doses daily, after two days; but he thinks that it is still too early to state whether stovarsol eradicates amoebic infection. In flagellate infection stovarsol is very effective, but has no influence upon strongyloides or ancylostomes. Dr. C. C. BASS considers the effects of stovarsol treatment superior to any previously obtainable with emetine.

P. H. M-B.

JOHNS (Foster M.) & JAMISON (S. Chaille). **The Treatment of Amebiasis by Oral Administration of Stovarsol. (Acetylamino-hydroxyphenylarsonic Acid).**—*Jl. Amer. Med. Assoc.* 1925. June 20. Vol. 84. No. 25. pp. 1913-1914. [6 refs.]

The results of treatment with stovarsol in 46 patients have been eminently satisfactory, complete relief of all dysenteric symptoms in all patients being experienced within a period of three to six days on the administration of 0·5-1·0 gr. of stovarsol by the mouth daily. In clinical severity these cases ranged from acute fulminating infections with thirty and forty blood and mucus stools daily, down to the very chronic variety. The treatment has been found especially advantageous in patients with severe cardiac lesions, in pregnant women and in small children.

In a series of 27 patients, 4 were apparently cured by the administration of 0·75 gm. of stovarsol daily for 7 days ; 16 by two such courses, with a 7-day rest between ; one with three courses ; four with four courses and one with seven, while one relapsed frequently in spite of eight courses.

Twenty-one have remained free from all symptoms and parasites for an average of 3·8 months, 6·5 months being the maximum.

The simplicity of the administration of this drug compares very advantageously with former methods.

The experimental administration of three times the maximum kilogram-dose of stovarsol to a dog for one month was not followed by any demonstrable tissue changes in the organs.

P. H. M-B.

PETZETAKIS. **Le stovarsol dans la crise aigue de la dysenterie amibienne, la lambliose et autres parasitoses intestinales ; son action preventive probable contre l'infection amibienne.**—*Presse Méd.* 1925. Mar. 7. Vol. 33. No. 19. pp. 299-301. [1 ref.]

An extensive trial of stovarsol has been made in Alexandria. The records of three cases of acute amoebic dysentery are given. Stovarsol is exhibited in three tablets daily, comprising 0·75 gm., and, as a rule, the treatment is spread over 8, occasionally 16 days. After the third or fourth day a great improvement in the stools takes place. One chronic case is reported in which stovarsol failed and emetine given subsequently succeeded. Citing a number of clinical records the author believes that stovarsol is an excellent remedy for parasitic infections of the intestinal tract. It is well tolerated in doses of ½-1 gm. daily for adults. During the acute attack of amoebic dysentery it seems to act in the first 48 hours, in others it is necessary to increase the dose, and, finally, there is a residue in which it appears to have no action. In chronic or relapsing cases it is necessary to persist in the treatment, and in these it is advisable to combine stovarsol with emetine injected intramuscularly or intravenously ; but, in contrast to the latter drug, it may be exhibited over prolonged periods without any ill-effects. The general health appears to be much improved by its use. In children who cannot tolerate emetine it is invaluable. The daily doses are as follows :—

Up to 1 year ...	0·05-0·08 gm.
1-2 years	0·08-0·10 gm.
2-3 years	0·10-0·15 gm.
3-5 years	0·15-0·25 gm.

The treatment should be persisted in for 5-6 days and recommenced after an interval of 2-3 days. A few cases of infection with lamblia and trichomonas seem to show that it is equally efficacious against these parasites. Possibly stovarsol exerts a prophylactic action against amoebic dysentery, and one experiment is cited in support of this claim. A volunteer was obtained who swallowed dysenteric material containing amoebae and cysts in capsules each containing 1 cc. of the material. He was treated with four tablets of stovarsol daily for three consecutive days (*i.e.*, 1 gm. daily). No dysenteric symptoms or other ill results ensued.

P. H. M-B.

SPENCER (J. Heatley). **Stovarsol in the Treatment of Amoebiasis.**—*Jl. Roy. Army Med. Corps.* 1925. Mar. Vol. 44. No. 3. pp. 216–217. With 1 chart in text.

Some preliminary observations of the results of stovarsol treatment in intestinal amoebiasis are given. The first case was a chronic dysenteric passing cysts. Emetine and emetine-bismuth-iodide treatment proved unavailing and the amoebic dysentery recurred. Stovarsol was then commenced, and 144 grains were given within 12 days. Frequent tests have been performed since, and he has remained free from all symptoms for six months. Giardia cysts, however, still persisted.

The second case was one of amoebic hepatitis with a high persistent leucocytosis which did not yield to emetine, but a rapid and striking improvement took place as soon as stovarsol was given—gr. 8 per diem—total of 56 gr.

The third case was one of amoebic dysentery in a child, aged 2½. Emetine in ¼ gr. doses daily failed to affect the entamoebae, and was followed by stovarsol—gr. 1 daily for 12 successive days. Ten days later the amoebae reappeared, but were finally removed by a further 6 gr. of stovarsol. No further symptoms have been noted.

Two more cases are recorded, in which the records are not quite so satisfactory, though the drug appears to have a direct action also upon trichomonas.

P. H. M-B.

BEIJNEN (G. J. W. Koolemans). **De behandeling der amoebendysenterie.**—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 80–89. [10 refs.] English summary pp. 90–91.

Thirty-one cases of amoebic dysentery were treated by yatren. Of these 22 were cyst-carriers, but nearly all had suffered repeatedly from amoebic dysentery; the other 9 were passing active amoebae. The treatment consisted in giving three times a day, for 10 days, a capsule containing ¾ or ½ gramme of yatren. After the treatment the stools were examined regularly every fortnight for a period varying from two months to a year and a-half. Of 17 cases controlled in this way in only one did cysts reappear after a month; no relapses were observed during the observation. The author concludes that yatren is a very efficient drug in treatment of amoebic dysentery and should be given by the mouth as indicated.

P. H. M-B.

VIALARD & DARLEGUY. **Traitement par le dérivé formylé de l'acide méta-amino-oxy-phénylarsénique de quelques cas d'amibiase chronique.**—*Presse Méd.* 1925. June 6. Vol. 33. No. 45. pp. 748–749. [1 ref.]

In chronic cases of amoebiasis treparsol has a rapid and astounding action and, moreover, a distinct stimulating effect in contrast with the depressant action of emetine. Three tablets are given daily for a week or more, a total of 5·25 gms. The author has no doubts about the amoebicidal action of the drug, and, although it contains 28·75 per cent. of arsenic, it is well tolerated by the liver. He thinks the results are more or less permanent. Details of five cases are given.

P. H. M-B.

CHIANG (S. F.). **The Rat as a Possible Carrier of the Dysentery Amoeba.**—*Proc. Nat. Acad. of Sciences, U.S.A.* 1925. May 15. Vol. 11. No. 5. pp. 239–246. With 2 plates. [5 refs.]

From experiments here fully and satisfactorily described the author makes the formal conclusion that *Entamoeba histolytica* of human origin can be transmitted to white rats either by rectal inoculation of material containing trophozoites or by feeding with material containing cysts. He shows that the amoeba from the experimentally-infected rat is typically pathogenic to kittens; also that clean rats associated with the experimentally infected rats become infected. The infection of rats experimentally infected may persist for at least four months. The results of this investigation incriminate the rat as a possible carrier of *E. histolytica.*

Incidentally, the author discovered white rats naturally infected with an amoeba (*Entamoeba histolytica murina*) which, if not identical with *E. histolytica,* cannot be discriminated with certainty; it is very readily cultivated on the medium described by BOECK and DRBOHLAV and encysts readily when the liquid of the modified medium described below reaches suitable concentration by evaporation; and it can be transmitted to kittens, to which it seems to be only mildly pathogenetic.

An amoeba similar to *Endolimax nana,* but possibly biologically distinct, has also been discovered in laboratory rats, and is here provisionally named *E. ratti.*

With regard to the methods of cultivation described by BOECK and DRBOHLAV, and followed in this study, the author notes a modified medium in which 100 cc. of beef-broth is substituted for 25 cc. of Locke Ringer solution in the preparation of the egg-slant, and the serum is omitted from the fluid subsequently added.

A. Alcock.

PETZETAKIS. **Recherches expérimentales sur le rôle pathogène des amibes des crachats dans la bronchoamibiase.**—*Rev. Méd. et Hyg. Trop.* 1925. May-June. Vol. 17. No. 3. pp. 136–139.

Recent experiments are recorded of inoculations of cats *per rectum* with the amoebae in the sputum of bronchoamoebiasis. The sputa were collected in a sterile Petri dish, mixed with sterile saline and injected with a catheter and attached syringe. The first animal died 11 days after injection with the symptoms of acute dysentery and characteristic appearances of the large intestine. Amoebae are said to have been found in the stools. The second cat also died, but was not examined.

In two of three other animals infected at a later date the anus was sutured. The characteristic intestinal lesions were observed and in one three minute pin-head abscesses. Four out of the ten showed no symptoms of any kind. No microscopic sections of the diseased tissues appear to have been made.

P. H. M-B.

LWOFF (A.). **Chytridinées parasites des amibes de l'homme. Possibilité de leur utilisation comme moyen biologique de lutte contre la dysenterie amibienne.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 18–23. With 4 figs. [6 refs.]

The author describes and figures the Sphaerita which has been observed by various writers cited in the active forms—but never in the cysts—of *Entamoeba coli*, *E. nana*, and *E. histolytica* (as well as in some free-living amoebae). The amoeba ingests the spore of the Sphaerita and is inhibited from encystment and ultimately killed by the growth and multiplication of the Sphaerita. The author seriously propounds the utility of Sphaerita in the treatment both of amoebic dysentery and of cyst-carriers.

A. Alcock.

HALL (James H.) & REED (Alfred C.). *Endameba coli.* **A Clinical Study.**—*Jl. Amer. Med. Assoc.* 1925. June 20. Vol. 84. No.. 25. pp. 1914-1915. [1 ref.]

Reed has for some time held the opinion that *Entamoeba coli* may be potentially pathogenic; its capacity for damage to its host may be due to direct damage to the mucosa, to irritation causing reflex symptoms, or to disturbance of digestive processes. The complaints and symptoms of patients harbouring this parasite were variable and indefinite and usually described as neurasthenia. The treatment included three doses of neo-arsephenamin, ten doses of emetine hydrochloride, and 30 grs. of E.B.I. By these means *E. coli* can be eradicated in the same way as *E. histolytica*.

P. H. M-B.

BERCOVITZ (Nathaniel). **Viability of Cysts of Human Intestinal Amoebas as determined by Exposure to Various Substances and Subsequent Staining in Haematoxylin.**—*Univ. California Public. Zool.* 1924. Sept. 17. Vol. 26; No. 13. pp. 249–261. [3 refs.]

The manure-value of faeces is not destroyed by septic tank treatment, and the author's experiments were undertaken to ascertain whether the value would be affected by such modifications of the treatment as should destroy parasites in the faeces—in particular encysted amoebae. From his experiments here recorded he makes a half-hearted conclusion that " if morphology be any guide " cysts of *E. coli* and *Councilmania lafleuri* [if these be distinct] are killed by " bichloride of mercury, carbolic acid, lysol, or formalin all in strength of 1 per cent., or with brine half strength," in one hour. Circumstances precluded continuation to the main object of the investigation.

A. Alcock.

i. WAHLBERG (Johannes). **Två fall av amoebiasis.** [Two Cases of Amoebiasis.]—*Finska Läkaresällskapets Handlingar.* 1924. July-August. Vol. 66. pp. 539–549. With 1 fig. [14 refs.]

ii. GALMOZZI (F.). **Contributo allo studio delle amebiasi autoctone.**—*Giorn. di Clin. Med.* 1925. Feb. 28. Vol. 6. No. 3. pp. 104–111.

iii. GIOSEFFI (M.). **Forme di sporulazione della** *amoeba hystolitica* **Schaüdinn nel sangue circolante.**—*Riforma Med.* 1925. Mar. 23. Vol. 41. No. 12. p. 276. [13 refs.]

i. The two cases described appear to be the first of tropical amoebic dysentery that have occurred in Finland. The first case was a man of 34 who had previously been living in S. Australia for a couple of years. The second case was a sailor of 36. He first fell ill on a boat off the African coast.

E. E. Atkin.

ii. This paper reviews once again the question of indigenous amoebiasis in Italy, largely from the records of cases by previous writers, but to this list are now added seven more.

iii. The author says that in 1910 he found sporulating forms of *E. histolytica* in the blood as well as in the dejecta.

H. Harold Scott.

BACILLARY DYSENTERY.

CONNOR (Roland C.) & BATES (Lewis B.). **A Clinical and Bacteriological Analysis of the Bacillary Dysentery Cases in Ancon Hospital during the Past Five Years.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 410–421. [3 refs.] [United Fruit Company, Boston, Mass.]

Bacillary dysentery occurs frequently in localities where sanitation is defective. The Canal Zone and the adjacent cities of Panama and Colon are directly under the supervision of the Health Department, so that lack of sanitation as a causative factor in this locality can be eliminated. This applies to the water supply, sewage disposal and flies. The milk supply for the Canal Zone has been pasteurized during the whole of the five-year period. The spread of bacillary dysentery in the Zone and adjacent cities must, therefore, be wholly due to carriers. The first outbreak occurred in 1918 amongst the nurses at Ancon Hospital. Ten infections with *B. dysenteriae* were recorded, three of which were severe. The source of infection was successfully traced to a carrier. During the five-year period 1919–1923 routine stool cultures have been made on all cases of enteritis and enterocolitis, and 66 cases of bacillary dysentery were diagnosed and treated. The ages of the patients ranged from 3 months to 59 years. The average time spent in hospital was 15·8 days. There were 19 deaths, all in infants and children under 6 years of age; 6 occurred within 24 hours of admission. The average monthly incidence was higher in February and March, both dry-season months, than in May and June, the first two rainy months of the year.

For several years the authors have classified and designated dysentery bacilli by the group system recommended by THJØTTA; three groups, the Shiga, Flexner, and Sonne, being recognized. Of the Shiga (Group I) 4 cases were recognized, of the Flexner (Group II) 39, and of the Sonne (Group III) 18. Ten per cent. of cases would not have been detected had they not come to autopsy. A variety of intestinal disorders may be mistaken for bacillary dysentery. A child admitted to hospital with high fever, convulsions and diarrhoea should be suspected of having this infection. Children are more susceptible than are adults, and the disease is usually more fatal to them, and it is more difficult to prevent cross-infection in children's wards.

The authors believe that carriers are entirely responsible for the spread of the disease in the Canal Zone, and they cite the case of a soldier who was first recognized as a carrier over a period of 4 months, of the Flexner bacillus, but subsequently developed clinical dysentery. They believe that the convalescent carrier is the common factor, but the healthy carrier is not negligible. They conclude by stating that the disease does not receive in tropical America the attention which its frequent occurrence merits.

P. H. M-B.

TROUDE (M.). **Etude épidémiologique sur la dysenterie à l'armée du Rhin de 1919 à 1924.**—*Rev. d' Hygiène.* 1925. June. Vol. 47. No. 6. pp. 490–513. With 1 map. [3 refs.]

Bacillary dysentery is endemic in the Ruhr district and cases occurred amongst the Army of Occupation there, but in nothing like the same proportion or intensity as during the period of hostilities. The first epidemic here described lasted from July to October, affected some 80 cases, and caused three deaths, the causative organism being Flexner's bacillus. It coincided with a similar epidemic amongst the civil population, and the greatest number of cases occurred in troops which were in close contact with the civilians. During the autumn of 1921 a recrudescence was noted in the neighbourhood of Düsseldorf with a total of 318 cases, the majority due to Shiga's bacillus. No dysentery was notified in 1922, but the figures rose to 392 in 1923 and 80 in 1924. The Rhine district accounted for the great majority of the cases. The symptoms were classical and articular rheumatism was noted. The gravity was feeble compared with that of the epidemic among the civilians. In treatment stress was laid upon the injection of antidysenteric serum, to which little value was attached by the Germans.

Contrary to war experience, cases continued to crop up during the winter season. Amongst prophylactic measures the greatest importance is attributed to the oral vaccination of BESREDKA. At an estimate nearly 3,000 men were vaccinated by this method in the Army of the Rhine in 1923 and 1924, and not a single one contracted dysentery.

P. H. M-B.

HUEBSCHMANN (P.). **Beiträge zur Bakteriologie und pathologischen Anatomie der Ruhr.** [Bacteriology and Anatomic Pathology of Dysentery.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1925. Feb. 24. Vol. 254. No. 3. pp. 811–829. [40 refs.]

This paper is founded upon material collected in the epidemic outbreak of bacillary dysentery in Leipzig in 1917. The author is by no means convinced that the bacilli hitherto described are responsible for all cases of bacillary dysentery. Of 100 strains of dysentery bacilli isolated, two-thirds conformed to the Shiga-Kruse type and a much smaller proportion to the Flexner type. Others he was unable to classify so accurately, and he emphasizes once more the difficulties of this hackneyed subject. In explaining the pathological appearances of dysentery the author believes that the infection is contracted *per os*, and owing to dyspepsia and exaggerated peristaltic action the organisms escape the destructive action of the gastric juice and affect those parts of the large intestine in which the faecal contents are held up, as, for instance, the caecum, the flexures and the rectum. The inflammation of the lymphoid tissue in the intestine, which is regarded by some authorities as the primary, he considers as a secondary manifestation. Adenomatous downgrowths of the epithelium are commonly observed in bacillary dysentery in children, and one case of polypoid inflammation has come under his notice.

P. H. M-B.

BROKMAN (H.) & PRZESMYCKI (F.). **Sur la susceptibilité individuelle à la dysenterie.**—*C. R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 989–991 [1 ref.]

Brokman (see this *Bulletin*, Vol. 21, pp. 37/352) has already described a cutaneous reaction following intradermal injection of Shiga-Kruse toxin. In persons in good health the reaction is positive in 80 per cent. of cases and negative in 20 per cent. A positive reaction is revealed by a red inflammatory zone which appears 24–48 hours after injection. A local necrosis of the upper layers of the skin may appear in people who have previously been injected with antidysenteric serum. The underlying reaction is probably the same as in the Schick test, and indicates an affinity of the human tissues for the toxin in question and is an expression of normal susceptibility. The positive reaction depends upon the toxic element, because should it be heated to 100°C for 10 minutes, or be neutralized by antidysenteric serum, no reaction occurs. 800 individuals have now been examined, and the reaction appears to be influenced by age. Newly-born infants give reaction less readily than those in their second year. After this age the percentage of positive reactions diminishes. Experiments on mice with the serum of susceptible persons seem to prove that it exercises a protective action in neutralizing the dysenteric toxin. Those mice, injected with the serum of men who gave no reaction and inoculated subsequently with toxin, all died. The physiological immunity in dysentery appears to be the same as in diphtheria, and lies in the hereditary capacity to produce normal antitoxins.

P. H. M-B.

ENLOWS (Ella M. A.). **Vaccination by Mouth against Bacillary Dysentery.**—*Public Health Rep.* 1925. Apr. 3. Vol. 40. No. 14. pp. 639–649. [23 refs.]

The method of vaccination by the mouth is not new, for it was used more than 19 years ago to produce immunity in Shiga dysentery. BESREDKA'S experiments went to show that it is facilitated by the use of bile as an erosive agent. In the experiments here related, the vaccine was readily introduced, either through a small zebra catheter, or by pipette or syringe; no food was given for 18 hours prior to its administration. Mortality is lessened if cultures not more than six hours old are used, and suspensions of dried organisms appear to be preferable, as the toxicity is less variable. The initial dose for vaccination *per os* should be 2,000,000,000 organisms in each cc., the suspension having the turbidity of 1,000 parts per million. In some of the experiments the vaccinating doses were given on three successive days with a 7–10 day interval, followed by three or more daily doses and a test dose 10–18 days later. In some cases the bile was given a day before, in others, a few minutes before the ingestion of the culture. A few experiments were made with Flexner's bacillus, in which very much larger doses can be used than of Shiga. A table is given of 166 rabbits vaccinated by various routes and the protection thereby obtained. Of 106 vaccinated by the mouth 57 per cent. survived; of 28 vaccinated intravenously 45 per cent.; of 32 vaccinated subcutaneously 70 per cent. Whilst the greatest degree of protection is afforded by the subcutaneous route, 57 per cent. is a very encouraging figure for the oral method. In order to test whether bile is necessary for the development of oral protection, experiments on 92 animals were undertaken; out of 63 rabbits to whom beef bile was administered 49 per cent. survived; but out of 29 animals without bile 59 per cent. As regards comparative toxicity of the three methods, the intravenous is naturally the most dangerous, as the greatest amount of toxin is thereby absorbed, but there appears to be no great difference between the other two methods. The final conclusion is that since at least some immunity follows vaccination by the mouth that method is worthy of further trial.

P. H. M-B.

COSTA (S.), BOYER (L.) & VAN DEINSE (F.). **Vaccination antidysentérique (bacille de Flexner) collective, par la voie digestive.**—*C. R. Soc. Biol.* 1925. June 19. Vol. 93. No. 21. pp. 122–124.

In an outbreak of Flexner dysentery on board a training ship of the Dutch Navy, fifty cases developed and others after arrival in port; immunization of the remainder of the crew was therefore attempted. The vaccine consisted of a culture of a 24-hour-old broth-culture sterilized at 60°C. for an hour. The vaccine, in doses of 1 cc. on each of three consecutive days, was administered to the whole crew, totalling 348 men, three hours after breakfast, and, at the same time, in order to judge more fully the full effect, the hygienic restrictions which had been formulated were temporarily abrogated. The vaccine did not cause any disagreeable symptoms. The same dose was administered to the sick as to the healthy, but no exacerbation or dysenteric symptoms were recorded. The epidemic was suddenly arrested, and after the date of the last dose of vaccine only one mild case of dysentery occurred. Discounting all other extraneous factors, the extinction of the epidemic must be attributed to the vaccine.

P. H. M-B.

CALALB (G.) & IONESCO (V.). **Sur un cas de pyélonéphrite à bacilles dysentériques.**—*C.R. Soc. Biol.* 1925. May 29. Vol. 92. No. 18. pp. 1460–1461. [1 ref.]

Pyelonephritis due to dysentery bacilli is a rare condition. One such case was observed in Roumania in a young primipara who was attacked in the eighth month of pregnancy with the customary symptoms of this affection and daily fever accompanied by a definite leucocytosis. In cultures made from catheter specimens at five-day intervals an organism was recovered which gave the correct cultural reactions of Flexner's bacillus ; it was agglutinated by an anti-Shiga serum as well as by an anti-Flexner. The patient recovered on an autogenous vaccine.

P. H. M-B.

CRUZ (J. da Costa). **O emprego do bacteriophago no tratamento das dysenterias bacillares.**—*Sciencia Medica.* 1925. Feb. 28. Vol. 3. No. 2. pp. 153–157. [1 ref.]

In the treatment of dysenteries the author brings forward evidence that for those cases designated "oligotoxic," associated with Flexner, Hiss-Russell, and Strong's types of organism, bacteriophage is the method *par excellence* [*ante* p. 22–23]. Thus, in one instance, a child of 11 years, very weak and ill (whose brother had died of the same disease, a Hiss-Russell infection, a few days previously, after ordinary treatment, including antiserum), cure resulted with marvellous rapidity after the administration of bacteriophage. Another patient felt so well on the day succeeding his first dose that he ceased treatment ; relapse came on two days later, but renewal of the treatment brought about a rapid cure. A third had been subject to relapses almost every month for two years ; finally, bacteriophage was tried, and in two days the patient felt well and for two years has had no recurrence. For Shiga infections the antiserum should be given as well, to counteract the toxic element, the bacteriophage being merely bactericidal.

H. Harold Scott.

KUSAMA (Hiroshi). **A Note on the Viability of** *Bacillus dysenteriae*.—*Philippine Jl. Sci.* 1925. May. Vol. 27. No. 1. pp. 1–7. [1 ref.]

These experiments were made with a recently isolated Shiga strain. From the behaviour of the organism in various media and when subjected to drying the following inferences are drawn : Unlike the cholera vibrio, the dysentery bacillus is fairly resistant to drying, and will survive longer in sterile than in normal fresh stool. *B. dysenteriae* will survive a considerable time in water, but longer in sea than in tap or distilled water. Physiological salt solution and bile are the best media for the survival of this organism in the stool, while the combination of the two may help to preserve the organism in the stools of dysentery patients and in carriers.

P. H. M-B.

OERSKOV (J. L.). **Les bacilles appartenant aux groupes typhique, paratyphique, paradysentérique et** *coli*, **deviennent, après chauffage, hypersensibles à l'action de l'oxygène atmosphérique.**—*C. R. Soc. Biol.* 1925. Feb. 13. Vol. 92. No. 5. pp. 402–404.

In experiments on the thermo-resistance of organisms the author found a marked difference resulted, according as the organisms after heating were sown upon gelatin or bouillon in tubes. For instance, *B. paratyphosus* was found to be alive when inoculated into bouillon, after being heated for 20 minutes at 58°C., while on gelatin none grew after heating for six minutes. This is probably due to the fact that the organisms treated in this manner become hypersensible to the action of air. The paratyphoid organisms, as well as paradysentery and *B.*

coli are much more sensible to heat in open than in closed phials, and this fact should be taken into consideration in determining the thermo-resistance of these organisms.

P. H. M-B.

MELNIK (M.). **Contribution à l'étude des relations entre les glandes à sécrétion interne et l'immunité. Le corps thyroïde et le bacille de Shiga.**—*C. R. Soc. Biol.* 1925. Feb. 27. Vol. 92. No. 7. pp. 474–475; and Apr. 3. No. 12. pp. 944–945. [1 ref.]

Rabbits weighing 2 kilogrammes were subjected to thyroidectomy. The animals stood the operation well and presented no untoward symptoms as the result. Five days after the operation the animals were inoculated subcutaneously with 2 cc. of a 24-hour culture of Shiga's bacillus in bouillon. Preliminary observations appear to support the idea that extirpation of the thyroid gland increases the bodily resistance to dysenteric infection. Nine animals were operated on and five were used as controls. Of the latter all died; of the former five only.

Continuing his researches on rabbits inoculated with dysenteric toxin four days after thyroidectomy, the author found that in eight such animals four survived, one died after 17, one after 16 days, one in 6 and one in 24 hours, whereas in six control animals, two died in 7, one in 6, one in 5, and two in 4 days. This experience confirms his conclusion that removal of the thyroid gland increases the resistance of the rabbit to dysenteric infection.

P. H. M-B.

TUPA (A.). **Contribution à l'étude des lésions du système nerveux central, provoquées par la toxine dysentérique.**—*C. R. Soc. Biol.* 1925. May 1. Vol. 92. No. 14. pp. 1141–1142.

Various investigators have recently described haemorrhagic lesions of the central nervous system in rabbits after the injection of dysenteric toxin. Repeating these experiments Tupa finds that Shiga toxins when injected intravenously in rabbits produce death in 1–8 days. It is remarkable that the greater number of animals die of nervous symptoms without showing any intestinal symptom. In one batch of 18 rabbits inoculated with dysenteric toxin, 12 died with nervous phenomena and lesions of the spinal cord, in two others both the cord and intestine were affected, while four succumbed without any macroscopic lesions. In a second series of nine rabbits inoculated with the same toxin, six were found to have combined intestinal and nervous lesions. Further experience of 200 rabbits has confirmed the facts stated above. The nervous lesions are confined to the cervical enlargement of the cord and the bulb. Seen by the naked eye the lesions of the central nervous system are hyperaemic and haemorrhagic spots, ranging in size from punctiform haemorrhages to lesions which involve the whole diameter of the cord. Two forms of lesions can be distinguished, one due to the action of the toxin itself, the other more severe and mechanical, due to destruction of the nerve fibres by the haemorrhagic effusion.

P. H. M-B.

CALALB (G.). i. **Recherches sur les races de bacilles dysentériques en Roumanie.** *C. R. Soc. Biol.* 1925. May 29. Vol. 92. No. 18. pp. 1455–1457.

——. ii. **Recherches sur les races de bacilles dysentériques atypiques isolées en Roumanie.**—*Ibid.* pp. 1457–1460.

i. In 400 cases of dysentery in Roumania seen in 1924, dysentery bacilli of typical or atypical strains were isolated in 73, or 18 per cent. This relatively small proportion is to be ascribed to the rather late period of the disease at which the examination was performed. Some of the specimens were sent by post from all parts of Roumania, and could not be plated out for 2 or 3 days. The Shiga bacillus was isolated in 16 cases; the Flexner bacillus in 15; the Y bacillus in 12, and Strong's bacillus in one.

ii. In this Roumanian epidemic 40 per cent. of the organisms isolated could not be identified by the customary tests and were inagglutinable. A classification into eight groups is proposed, according to the sugar reactions and the capacity for forming indol. Although in this respect the first four groups tallied with Schmitz's bacillus, yet they were not agglutinated by an anti-Schmitz serum. These paradysentery bacilli were never isolated in the primary stages of the illness; they appear at a time when the typical bacilli have vanished. In one instance, morever, the transformation of an authentic strain of Shiga bacillus into an atypical organism has been observed to take place. The author is of opinion that paradysentery bacilli are merely true dysentery bacilli altered by external circumstances.

P. H. M-B.

SUZUKI (Tadashi). **Du sérum antidysentérique épuré.**—*Jl. Oriental Med.* 1924. Nov. Vol. 2. No. 4. French summary pp. 279–280. [In Japanese.]

These investigations were undertaken in consequence of the researches of BESREDKA, who demonstrated antitoxic bodies in the coagulated portion of the serum. 2 cc. of the coagulated antidysenteric serum of BESREDKA are emulsified in 20 cc. of sterilized distilled water, a dilution corresponding exactly with a similar amount of commercial antidysenteric serum. The author ascertained the lethal dose of Shiga bacilli for mice, which proved to be 0.3 cc. of a 24 hour culture of the bacillus, and injected five times this dose intraperitoneally, subsequently, in series, commercial antidysenteric serum, desiccated serum and Besredka's serum. Commencing with minute quantities, 0.0002 cc., he gradually increased it up to 0.5 cc. The following conclusions were arrived at:—

1. With commercial antidysenteric serum, 0·00625 cc. alone protected mice against 1·5 cc. of bacillary emulsion.

2. With desiccated serum diluted up to a concentration corresponding with commercial serum the same dose conveyed an equal degree of protection.

3. With Besredka's coagulated serum 0·025 had the same effect, but larger doses did not convey a parallel degree of protection.

4. The liquid antibody in the last preparation is less effective than in the commercial antidysenteric serum.

P. H. M-B.

O'BRIEN (R. A.) & RUNGE (B. F.). **The Standardization of Anti-Dysentery (Shiga) Serum.—II.**—*Brit. Jl. Experim. Path.* 1925. Apr. Vol. 6. No. 2. pp. 84–87. [1 ref.]

Details of methods employed for the standardization of antidysentery serum have already been published [see this *Bulletin*, Vol. 22, p. 22, SUDMERSEN, RUNGE & O'BRIEN, 1924] and the standard " toxin " and " anti-toxin " described. Commencing with their initial standards, the authors have now prepared a second toxin—3 A—which has been titrated against a test serum S. 9. The general scheme of the tests here described was to estimate three particular points, small numbers of mice being used. 18 commercial and standard antidysentery (Shiga) serums were tested in this manner. At the first point 80-100 per cent. of the mice are protected against the test-dose 0.2 mgm. of toxin ; at the second point, between 20 and 50 per cent. are protected, and at the third, less than 20 per cent. These points represent roughly the L O and L+ values of the serum. [These terms being convenient, but not being used in direct accordance with Ehrlich's definition.] Individual mice vary a good deal in their susceptibility to Shiga toxin, and also being delicate animals, they easily succumb to changes of temperature and feeding, so that it is difficult to assess exactly the intermediate point of toxicity. The provisional unit of serum recognized by these investigators is the amount which will neutralize the test-dose 0·2 mgm. of the standard toxin A.A.. (approximately ten lethal doses). A table exhibits the results of titration of sixteen serums issued by various laboratories ; the range of " values " obtained was found to be undesirably wide. At present it is possible for a clinician to purchase and use two samples of commercial serum of which, while bearing no indications on the labels, one would be 20 to 50 times stronger than the other in anti-toxin value. A final test was made with the object of ascertaining how accurately one could titrate the anti-toxic value of a standard serum if a moderate number of mice were used. From a review of the general results the opinion was formed that serums differing from one another by 20 per cent. in value might be distinguished.

P. H. M-B.

i. WAGO (Heinosuke), SUGA (Yoshihiko), GOTO (Mototaka) & SUZUKI (Yasukichi). [**On the Causative Agent of Pseudo-Dysentery, prevailing endemically in a Region around Shyonai, Yamagata Prefecture.**]—*Sei-I-Kwai Zasshi* (*Jl. of Sei-I Med. Soc.*). 1924. Dec. Vol. 43. No. 6. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 75.]

ii. ROBINSKI. **Die chronische Ruhr.**—*Muench. Med. Woch.* 1925. Mar. 13. Vol. 72. No. 11. pp. 432–433. [5 refs.]

iii. POSSELT (Adolf). **Ueber allgemeine Pathologie und spezielle klinische Fragen der enterogenen, speziel auf dysenterischer Basis entstandenen Magen- und Zwölffingerdarmgeschwüre.**—*Arch. f. Verdauungs-Krankht.* 1925. Jan. Vol. 34. No. 3/4. pp. 222–271. [Refs. in footnotes.]

iv. BAIL (Oskar). **Entstehung und Gesetze van Bakterien-populationen ; soziologische Studien an Dysenterie-bazillen.**—*Arch. f. Hyg.* 1925. Vol. 95. No. 1-2. pp. 1–39.

i. The authors claim in this paper to have discovered a new strain of dysentery bacillus distinct from anything hitherto described.

ii. This paper appears to contain no original observations. The author believes in the vaccine treatment of chronic bacillary dysentery and records the fact that this type of colitis is especially liable to a superimposed tubercular infection.

iii. In a long and discursive paper the author brings forward evidence for some connection between previous bacillary dysentery and the development of duodenal ulcer.

iv. A purely bacteriological paper. P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

CUNNINGHAM (J.), THEODORE (J. H.) & KRISHNAN (K. V.). **Further Observations on Latent Dysentery. The Practical Value of the Discovery of Latent Dysentery Cases as a Method of Dysentery Control.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 375–389. With 4 charts. [3 refs.]

A previous communication on this subject has been reviewed (see this *Bulletin,* Vol. 21, p. 38). By means of 10–12 consecutive macroscopic examinations of the stools, each jail population was divided into two groups, a normal and an abnormal, according to the evidence obtainable during the course of the inspections. All cases showing mucus and blood received appropriate treatment. The dysenteric index (the percentage of latent dysentery) was as follows :—

Col. Bateman's series	... ...	27·0 per cent.
Bellary series	... ...	30·9 ,,
Cannanore series	... ...	22·6 ,,

In other words, one third of the communities was found to be infected. Proof of the practical value of segregation of latent dysentery is seen from the following statements :—

The dysentery rate in the community declined with great rapidity when once these cases had been brought under control.

In the Bellary and Cannanore series 92·5 per cent. and 94.5 per cent., respectively, of subsequent admissions for dysentery were divided from other groups suffering from latent dysentery, which had been previously isolated. A very considerable number of men—48 out of 184—in one instance who were working in the cook-house were discovered to be suffering from latent dysentery; their detection and segregation resulted in great improvement in the general health of this community. The systematic macroscopic inspection of stools is the best and surest method of detecting cases. It is cheap and rapid and requires no special skill or apparatus.

P. H. M-B.

BERNARD (P. Noël), BABLET (Jean) & PONS (René). **Les dysenteries en Cochinchine.**—*Arch. Insts. Pasteur d'Indochine.* 1925. Apr. No. 1. pp. 3–37. With 2 text figs. 2 figs. on 1 plate & 1 folding chart. [89 refs.]

In 1924, 2,101 faeces examinations. 145 revealed *Entamoeba histolytica*; in 86 dysentery bacilli were isolated, making a total of 231 definitely diagnosed. The reaction of normal and abnormal stools (made with blue and red litmus papers) resulted in the following figures :—

The reaction of 500 normal stools was: acid in 8; neutral in 77; alkaline in 15.

A control series of pathological stools gave an alkaline reaction in 75 per cent. of those containing blood and mucus; in semi-formed motions alkaline and acid reactions were recorded in almost equal proportions. The alkalinity of the stools is in direct proportion to the gravity of the case. In the great majority of cases the return to neutrality coincides with a great improvement of the gastro-intestinal condition.

From the coprological point of view the amoebic dysentery stool has four cardinal characters: (1) alkalinity; (2) abundance of red blood corpuscles; (3) paucity of leucocytes; (4) non specific bacterial flora not generally stained by Gram. In 2,101 examinations in 1924 active *Entamoeba histolytica* were found on 104 occasions (*i.e.*, 5 per cent.), and the quadrinucleated cysts 41 times (*i.e.* 2 per cent.). Of these 2,101 stools 97 were frankly dysenteric. It is difficult to compute the mortality due to *E. histolytica*, but about 3 per cent. of the total deaths would seem to be a correct estimate.

In Saigon intestinal flagellates were encountered in 16·8 per cent. of diarrhoeic states and acute exacerbations of amoebic or bacillary dysentery. *Lamblia intestinalis* cysts were found in water filters in Cochin China by NOC, demonstrating the part played by water in the spread of the disease. In the whole series Lamblia was found in 74 cases, mostly in alkaline stools. From the specialized life history of the parasite the authors believe that an alkaline medium is necessary for the development of lambliasis.

Balantidium coli was found once only, in a native who was suffering from vomiting and diarrhoea. Intestinal spirochaetes were found in the greatest numbers in stools, which were alkaline in reaction and contained blood and mucus. Their pathogenic rôle is neglible in the great majority of cases. The authors describe two forms, a long and a short variety of *Spirochaeta eurygyratum*, and think they may play a part in gangrenous enteritis.

As regards bacillary dysentery in 1924, dysentery bacilli were isolated in 11·2 per cent. of suitable stools, and of these 30·2 per cent. were Shiga, 28 per cent. Flexner and 26·7 per cent. Hiss bacillus. In Saigon PONS has described a dysenteric syndrome in children, associated with a cocco-bacillus. Researches on yeast isolated from diarrhoeic conditions and dysenteric stools in Saigon indicate that these organisms played a secondary part in the production of the diarrhoea.

P. H. M-B.

O'CONNOR (F. W.). **The Electrical Sigmoidoscope in Tea Garden Practice. A Preliminary Note.**—*Proc. Assam Branch, Brit. Med. Assoc. Ann. Meeting Jorhat, 2nd Mar. 1925.* p. 29.

The author emphasizes in this paper the value of sigmoidoscopic examination in Tea-garden work, especially under circumstances where there is difficulty in obtaining stools for microscopic examination. In ten cases, recently observed, the evidence of a clinical cure appeared to be complete, though on osigmidoscopic examination ulceration was still present.

P. H. M-B.

HAUSMANN (Theodor). **Die absolut gute Prognose bei rigoroser, protrahierter, mit Nahrungsentziehung verbundener Abführbehandlung der Dysenterie.** [The Very Favourable Prognosis in Dysentery treated with Rigorous Prolonged Purgation and Starvation.]—*Arch. f. Verdauungs-Krankht.* 1925. Jan. Vol. 34. No. 3–4. pp. 193–221. [73 refs.]

The author bewails the fact that in recent papers by German writers upon the prognosis of dysentery, very little, if anything, is said of the different methods of treatment employed. So impressed is he with the efficacy of his " aperient treatment " that he has already stated in 1922 (see this *Bulletin*, Vol. 19, p. 704) that no one should die of dysentery, for during the last 20 years he has not had a fatal case or seen one lapse into the chronic stage. After discussing the pharmacological action of the various aperients generally in use, the author decides that none are so satisfactory as the salines, because they evacuate the large intestine so completely and bring about a transudation through the intestinal walls, which the others do not. A combination of aperients is most satisfactory. He therefore advises two doses of calomel powder 0·2 gm. at two hourly intervals, to be followed later by one teaspoonful of Ol. ric., and six hours afterwards sodium sulphate 25 gm. in half a glass of water. The motions at first faeculent soon become watery. In severe cases in order to make good the loss of fluid it may be necessary to resort to subcutaneous transfusion of Ringer's solution. Almost absolute starvation is necessary in order that the aperient treatment should be effective. For the first few days patients are not permitted anything more nutritious than tea and sugar, subsequently, various soups and meat infusions.

P. H. M-B.

SALMERÓN OLIVARES (J. M.). **Sobre alimentacion en la Disenteria aguda amibiana o bacilar.**—*Rev. Med. y. Cirug.* Caracas. 1924. July 31. Year 7. No. 76. pp. 177–185.

The views advanced by the author of this article on the feeding of dysenteric patients will probably meet with considerable opposition. After purging and giving serum or emetine, as the case may be, if the patient is " hungry for salt food " (" comida salada "), although the stools continue frequent, liquid, mucoid and blood-stained, and there is abdominal pain with fever and tenesmus, he allows the following, and affirms that he obtains excellent results and has not lost a patient : soup of green bananas, vermicelli or celery in fresh broth made from meat, chicken or pigeon, without fat, and seasoned with salt, garlic and onion. In two or three days he adds chicken, or pigeon, or loin of pork [!], avoiding fat, wheat or maize bread. Two or three meals are given daily, that much being eaten which leaves the patient still a little hungry. If this leads to increased peristalsis he gives opium or chlorodyne to control it.

H. Harold Scott.

HATAI (K.). **Ekiri (A Foudroyant Form of Dysentery in Children) in Dairen.**—*Jl. Oriental Med.* 1924. Nov. Vol. 2. No. 4. English summary p. 291. [In Japanese.]

This paper is based upon a special study of over 100 cases of ekiri, a fulminating form of dysentery in children. The author concludes that " ekiri " accounts for 29 per cent. of all cases of dysentery in Dairen ; it is most prevalent between the ages of 2 and 3 and is epidemic during the months of June, August and September. The mortality rate is 43 per cent., the highest rate occuring between the ages of 3 and 4. From the stools of patients the author obtained dysentery bacilli in 14 per cent. The Y bacillus of the acid or mannite fermenting type was most prevalent, and then the Hiss and Flexner types.

P. H. M-B.

TANAKA (Toshiwo). **Ueber die Hirnsymptome bei der foudroyant verlaufenden Kinderdysenterie und Ekiri.** [Brain Symptoms in the Fulminating Dysentery of Children and Ekiri.]—*Mitt. a. d. Med. Fak. d. Kais. Kyushu-Univ.* Fukuoka, Japan. 1924. Vol. 9. No. 1. pp. 139–171. With 3 charts in text. [72 refs.]

Infantile dysentery and "ekiri" in the district of Fukuoka, Japan, are very frequently complicated by encephalitis, which has been observed in 26·5 per cent. of cases and is responsible for the sudden death which often takes place in the disease. Children of 3 and 4 years most frequently suffer from dysenteric encephalitis, which sets in early, not infrequently on the third day of the infection, sometimes within twenty-four hours, and runs a very rapid course; 63·3 per cent. of those attacked die in 3 days, the majority within 48 hours. No. 4 type of dysentery bacillus is the one most frequently associated with this encephalitis. One of the most frequent symptoms is the vomiting of coffee-grounds material. Epileptiform convulsions, spastic paralyses, aphasia and conjugate deviation of the eyes may all occur. Cases of encephalitis are most frequently observed in the summer months, July-September, at a time when dysentery and ekiri is most prevalent.

P. H. M-B.

KESSEL (John F.). **The Ingestion of Erythrocytes by** *Trichomonas hominis* **and its Occurrence in the Pus of an Amoebic Liver Abscess.** —*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 151–152. [4 refs.]

Specimens of *T. hominis* from the stools of a patient suffering from bacillary dysentery and of *T. vaginalis* from the urine of another patient, passed at the time of menstruation, were found to contain ingested red blood corpuscles. Later, in August 1924, in examining the pus from a long-standing abscess of the liver, operated on by Dr. LUDLOW, in addition to actively motile forms of *E. histolytica*, numerous active *T. hominis* were found, but on this occasion none contained red blood corpuscles. The author is unaware of a similar previous occurrence. These observations do not necessarily indicate that *T. hominis* is *per se* able to produce pathological conditions in man, but its ability to ingest red blood corpuscles suggests that, under certain conditions, it may become pathogenic.

P. H. M-B.

GARRETT (F. D.). **Some Obstinate Cases of Chronic Diarrhoea due to Infection of the Duodenum by** *Giardia Intestinalis.*—*Southwestern Med.* 1925. May. Vol. 9. No. 5. pp. 172–175. With 3 text figs.

Four cases are described.

In the first the patient, age 58, had lost weight, was anaemic, and had suffered from diarrhoea for 3 years. Transduodenal lavage with methylene blue and acriflavin, alternately with hypertonic saline improved the condition, but did not dispel the Giardia.

In the second case the patient, age 51, had suffered from almost constant diarrhoea for 6 years. After being treated in vain with thymol, calomel, transduodenal lavage with methylene blue and acriflavin, and at length by cholecystectomy and appendectomy, he was put on thymol (50 gr. once a week) and sulphur (90 gr. daily at bed-time), along with transduodenal lavage with acriflavin (1 in 3,000 of hypertonic saline) ; and on this treatment the Giardia disappeared within a few weeks. In the third case, age 24, there was intestinal discomfort, accumulation of wind, and constipation ; appendectomy had been done a year before without any effect. This case was also treated successfully with thymol and sulphur, and was reported well 10 months afterwards. In the fourth case, age 41, the symptoms—pain in the abdomen, diarrhoea, lassitude, nausea—had continued during 6 years ; after thymol (50 gr. once a week) followed by transduodenal lavage, the patient began to improve on neosalvarsan (0·3 gm. weekly, intramusculаrê) and sulphur (90 gr. daily).

A. Alcock.

FUJII (Shyukiku). **[On the Influence of the** *Bacillus dysenteriae* **Shiga against the Sugar Concentration of Blood and the Cerebrospinal Fluid.]**—*Chugai Iji Shimpo* (*Central Med. Jl.*). 1925. Mar. Vol. 44. No. 5. [Summarized in *Japan Med. World.* 1925. May 15. Vol. 5. No. 5. pp. 127–128.]

SPRUE.

ASHFORD (Bailey K.). **Tropical Sprue in Porto Rico—A Synthesis of Fifteen Years' Work of Investigation and 2,200 Cases.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 686–700. [United Fruit Company, Boston, Mass.]

A number of observers consider sprue to be a state or condition, whilst the majority believe it to be a disease of unknown etiology, probably of microbic origin. There is reason to believe that the sequence of nutritional unbalance, digestive glandular incompetence, and a consequent fermenting mass of sugars, starches and fats affords the yeast-budding fungus, *Monilia psilosis*, a suitable medium for growth.

The exhaustion state is the usual predecessor of sprue. The leading features in 227 patients suffering from this condition were: disordered digestion with acid dyspepsia, constipation, a steady diminution in the size of the liver, a sallow complexion, lowered blood-pressure, asthenia and a moderate loss of weight. In 26 per cent. the tongue becomes sensitive to mild irritants, but there are rarely any lesions. There is also an indefinable irritability, vague pains in the body, and, occasionally, muscular cramps in the legs. A brownish-gray pigmentation over the malar prominences, forehead and cheeks may be noted. In none of these cases was *Monilia psilosis* found and all serological tests were negative. It is upon this background that sprue develops. The picture is now greatly enhanced; there is salivation and the passage of the large fatty stools. In 994 cases 40 per cent. complained of abdominal pain; 43 per cent. of nausea and 25 per cent. of occasional vomiting. There is probably no disease in which emaciation is greater and more rapid. At first the anaemia is secondary, but gradually the haemoglobin sinks, the colour-index rises and secondary blood-changes appear. In sprue and in pure nutritional unbalance there is a tendency towards retention of non-protein nitrogen and chlorides in the blood and a fall below the minimal normal of urea, uric acid and chlorides in the urine.

Of 1,435 cases of sprue, 1,202, or 83·7 per cent., were positive, mycologically, serologically, or both, for *Monilia psilosis*. Of 698 cases clinically free from any suspicion of sprue there were but 1.2 per cent. carriers. The author distinguishes between colonization and infection with *Monilia psilosis*. In sprue-cachexia it is much more difficult to find the organism, and serological tests are frequently negative. About three-quarters of the patients were between 20 and 60 years of age; children are much more frequently affected than has previously been supposed. In 1921 over 60 cases were in children under 10 years of age and four in children under one year. Out of 1,452 cases 59 per cent. were in females. Among 211 cases in which details of race were noted, there were 174 whites and 21 mulattoes, but no negroes. Sprue is rare in the full-blooded negro.

In Porto Rico sprue is distinctly an urban disease. Over 1,000 cases collected for this paper are inhabitants of San Juan, a city of 70,000 inhabitants. It is by no means a poor man's disease. The usually accepted relationship between sprue and dysentery is here denied. Amoebic dysentery practically does not exist where sprue is rampant in Porto Rico. The underlying predisposing factor is nutritional unbalance. The agricultural labourers are sustained by polished rice, beans, codfish, wild tubers, plantains and fruit. Fresh meat and milk are very scarce. This diet constitutes a serious food deficiency. Another factor of importance is carbohydrate excess.

The remainder of the paper is devoted to a restatement of the claims of *Monilia psilosis* as the etiological factor in sprue.

P. H. Manson-Bahr.

WOOD (Edward J.). **The Relation of Sprue and Pernicious Anemia to each other and to the** *Monilia Psilosis*.—*Southern Med. Jl.* 1925. Mar. Vol. 18. No. 3. pp. 157–161. [14 refs.]

No single description can fit all sprue tongues, for there are several types. Achylia gastrica occurs in a certain number of cases of sprue, but it is not universal; the author's experience is that it occurs in all when the disease is well established. The presence of achylia is put forward as one of the points of distinction from pernicious anaemia. The author asserts [quite wrongly] that the study of the anaemia of sprue has been neglected until quite recently. He knows of no disease which produces a greater degree of blood destruction. In addition to megalocytes, megaloblasts have been recorded in the blood. Neurological changes are not often recorded. A case is outlined in a woman from Porto Rico in whom symptoms of sprue and those of subacute combined degeneration of the spinal cord co-existed. The author records his growing conviction that *Monilia psilosis* is the cause of sprue. Recently he has recovered this organism from the faeces and from the gastric contents of a case of pernicious anaemia. In 24 cases of pernicious anaemia *Monilia psilosis* has been recovered from the pyorrhoeal pus in every case except those in which all teeth had been removed. Success in isolation depends upon the acidity of Sabouraud's medium. It must be titrated + 2 against phthalein indicator; high degrees of acidity tend to cause liquefaction of the agar. Guineapigs fed on cultures of *Monilia psilosis* lost weight and became anaemic. The red blood cells were profoundly affected and there was a reduction of haemoglobin of 15 to 20 per cent. The bone marrow showed corresponding changes. It is suggested that the toxins produced by *Monilia psilosis* are capable of producing definite haemolytic changes.

P. H. M-B.

THOMSON (J. D.). **Some Analyses of Materials obtained from Sprue Cases.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 18. No. 7. pp. 381–382.

The analyses of sprue stools were undertaken to ascertain if the pancreas played any part in the disease. The proportion of neutral fat to fatty acid in normal stools is independent of the diet and remains practically constant in the ratio of 1 : 2. The organ chiefly concerned in the splitting of neutral fat is the pancreas. In pancreatic deficiency the proportion of neutral fat to fatty acid in the stools is increased—in extreme cases it may be 10 : 1 or 15 : 1. In sprue stools the proportion of fatty acid to neutral fat is increased. Analyses of seventy stools in a dozen well-marked cases of sprue showed this proportion to be on an average 4 : 1 or 5 : 1; in one case, during an exacerbation of symptoms, the proportion was 8 : 1. The weight of "total fat" (neutral fat and fatty acid) varied from 25–50 per cent. of the weight of the dried stool. To determine the part played by bacterial action in the excessive proportion of fatty acid over neutral fat, recently passed stools were divided into two parts—one was submitted to analysis at once. while the other was incubated at 37°C. for 24–48 hours before the fats were extracted. The results were contradictory, but the experiments showed that bacterial action could not account for the large increase in the proportion of fatty acid to neutral fat in sprue stools.

The *diastatic reaction* of the urine was inclined to the low side, D=6·6 to 10 being a fair average. The activity of the *duodenal juice.* Samples were obtained, by means of Einhorn's tube, from two selected cases at intervals of a week or a fortnight and MacNeil's technique employed in testing. All three ferments, diastase, trypsin and lipase, were found to be normally active. There is no evidence of pancreatic excess; why then are the fatty acids not absorbed in the normal way to maintain the normal proportion of neutral fat to fatty acid? *Sugar tolerance* tests were undertaken to give some indication of the glycogenic function of the liver. There is no evidence of bile deficiency, for bile can be demonstrated in the duodenal juice. A degree of sugar intolerance, most noticeable during exacerbations of the disease, could be demonstrated. This pointed to a temporary inefficiency of the glycogenic function of the liver.

P. H. M-B.

Scott (H. Harold). **On the Value of the Estimation of the Ionic Calcium of the Serum in the Diagnosis of, and as a Gauge of Progress in Sprue.**—*Ann. Trop. Med. & Parasit* 1925. Mar. 31. Vol. 19. No. 1. pp. 23–36. [7 refs.]

The estimation of the ionic calcium in sprue has a twofold purpose, firstly as a means of diagnosis, and, secondly, as a gauge in estimating the course of the disease. There may be two types of calcium deficiency due either to excessive excretion and consequent calcium starvation of the tissues, or, the total being normal, the active ionic calcium is decreased. In sprue it is the latter. The error would appear to lie in the failure on the part of the tissues to use the calcium absorbed from the alimentary canal. The underlying factor is some circulating toxin which acts either by effecting a combination with the blood calcium or by interfering with the function of the parathyroids. Toxic substances are said to stimulate thyroid function, and the antagonistic action of this gland to that of the parathyroid is exemplified in sprue. Should an impure preparation of parathyroid be used in treatment or, when progress is being made, this substance be stopped and thyroid given in its place, a return of sprue symptoms can be readily induced. The value of the calcium estimation test in diagnosis is well illustrated by the record of a case in which no reduction of the ionic calcium was found, although sprue-like symptoms were present. On further examination the patient was found to be suffering from a chronic infection with *Entamoeba histolytica.*

A table shows the ionic and total calcium estimation in 32 cases of sprue. The average ionic calcium content works out at 6·9 per cent., the total calcium at 9·7 per cent. In 105 cases, other than sprue, *i.e.*, amoebic and bacillary dysentery, mucous colitis and syphilis, malaria, kala azar, filariasis, undulant fever, etc. the ionic calcium averaged 10·2 per cent. Important as is this test in diagnosis, it is more so as an indication of progress. The serum should be examined at intervals of a week or a fortnight. Any return of symptoms such as a sore tongue or aphthae is accompanied by a drop in the ionic calcium. The following statements are justifiable.

"1. Ionic calcium is always low in the untreated disease, even in the early stages.

"2. The ionic calcium increases as the condition improves.

"3. The ionic calcium falls again if a relapse occurs.

"4. Improvement takes place when calcium is administered alone, but is slower and less stable than when parathyroid is given in addition."

These points are emphasized by illustrative cases. The improvement, as evidenced both by the clinical condition and by the rise in the ionic calcium in the serum, is more rapid when, in addition to calcium, parathyroid is given to regulate its metabolism.

Two tables are given to illustrate this point. The first shows the slow and gradual rise in the ionic calcium which takes place under ordinary treatment, the second the rapid increase from 6·9 per cent. to 11·6 per cent. which takes place sometimes within a period of eight weeks in cases treated with calcium and parathyroid.

P. H. M-B.

Scott (H. Harold). **The Treatment of Sprue.**—*Lancet.* 1925. Mar. 21. pp. 620–621. [1 ref.]

Until recently sprue patients were advised against returning to the tropics, but recent rational methods of treatment bring about a rapid and permanent cure if the case is taken in hand early. Under empirical methods, the author discusses the apparent value of the milk treatment, and the strawberry cure, but he points out that fruit can only form a small part of the dietary. The administration of vaccines is, in some cases, attended by good results; but the organism cultivated cannot be the sole causative agent since very different organisms produce apparently equal beneficial effects. Yellow santonin and emetine which have been most extensively used in treatment are uncertain

The calcium and parathyroid treatment is a rational one based upon laboratory tests The fatty diarrhoea, the cramps, the oedema and tetany are some of the symptoms attributable to faulty calcium metabolism. In sprue, but in no other sprue-like conditions, the free or ionic calcium in the blood is reduced by 30–40 per cent. It is the regulation of calcium which is upset. By flooding the system with calcium this deficiency is temporarily made good and improvement ensues. This regulation of calcium is controlled by the parathyroid glands, so that when this extract is given twice daily in doses of $\frac{1}{10}$ gr. the symptoms of sprue clear up with marvellous rapidity. The stomatitis disappears in ten days or so, the colour returns to the faeces in two to three weeks.

The technique of estimating the ionic calcium is as follows:—

$1\frac{1}{2}$–2 cc. of blood in a serum tube is allowed to clot yielding 1 cc. of serum which is heated in a water-bath to 56°C. for one hour. By adding fixed amounts of various dilutions of ammonium oxalate to 10 volumes of fresh normal serum the strength of oxalate which will just prevent clotting is found. By adding two volumes of various dilutions of calcium chloride the dilution just sufficient to bring about complete clotting of the blood is determined. By calculation the calcium content of the serum is estimated, which in normal persons is between 10·4 and 11·4 mg. per 100 cc. In severe sprue cases it is about 6·5 mg.

Treatment consists of putting the patient to bed for the first 14 days, allowing milk only, beginning with 3½–4 pints daily and increasing by ½ pint in the 24 hours till 7 to 7½ pints are reached. Calcium lactate is given in cachets, containing 15 gr. each, thrice daily and parathyroid extract gr. $\frac{1}{10}$th twice daily, and it is absolutely essential that it should be free from thyroid extract. Constipation should be corrected with liquid paraffin. From the tenth day onwards plain biscuits should be allowed by which time the ionic calcium has increased to between 7 and 8 mg. per cent. At the end of three weeks the average patient can take milk puddings, eggs, fish, potato, carrot and bananas; and in the fourth week chicken and fruits. The calcium can be reduced in the third to fourth week and stopped at the end of the fourth. The parathyroid extract should be continued in full doses till the fifth week, then reduced until it is stopped altogether at the end of six weeks. This, however, can only be gauged with certainty by the blood test.

P. H. M-B.

FIELD (P. C.). **Treatment of Sprue by Parathyroid Extract.**—*Jl. Roy. Army Med. Corps.* 1925. June. Vol. 44. No. 6. pp. 456–457.

The patient was a multipara, who, during a pregnancy of seven and a-half months, suffered from well-marked symptoms of sprue. On her admission to hospital it was difficult for her to assimilate even milk. Within one week of careful dieting, calcium lactate 30 gr. daily and parathyroid gr. one-fifth, with a daily bowel-wash of saline, a great improvement was recorded. Nine days after admission a premature child of 4 lb. 12 oz. was born, after which great improvement took place, so that she was discharged after six weeks treatment. The total amount of parathyroid taken was 7$\frac{8}{10}$ gr.

This case is said to illustrate the remarkable response to parathyroid medication. During the frothy-motion stage bowel-washes are of undoubted value, though possibly responsible for the premature labour. When last seen the patient had regained her weight (Jan. 1925).

P. H. M-B.

CASTELLANI (Aldo). **Beneficial Action of Raw Pancreas in Certain Cases of Sprue. Insulin in Cases of Sprue complicated with Diabetes**—*Jl. Trop. Med. & Hyg.* 1925. June 15. Vol. 28. No. 12. pp. 230–231.

In the routine treatment of sprue the patient is kept at complete rest in bed on a strict milk diet, diluted at first with Vichy or plain water. In most cases bicarbonate of soda, gr. xxx–one drachm, is given t.d.

Raw pancreas from lambs, sheep or calves is used; it must be absolutely fresh, minced or sieved, and is eaten by the patients in teaspoonful to tablespoonful doses with milk once or twice daily. When raw pancreas is unobtainable, pancreatic tablets of Armour are used, though their action is not to be compared to that of the whole gland.

In three cases of sprue, complicated by diabetes, the administration of insulin caused the disappearance of the glycosuria and polyuria, but had no action on the sprue symptoms. Raw pancreas given by the mouth influenced the sprue beneficially, but did not control the glycosuria.

P. H. M-B.

ELDERS (C.). **Blood Changes in Sprue and Pernicious Anaemia.**—*Lancet.* 1925. June 13. p. 1274. [Correspondence.]

This correspondence [*ante*, p. 371] has elicited the fact that the figures of the haemoglobin index, as published by Elders, have been calculated with Sahli's haemoglobinometer, in haemometer degrees of which 80 correspond to 100 per cent. haemoglobin (the normal). In order to obtain percentages, one has to calculate them; thus, 20 Sahli is equal to 25 per cent. haemoglobin. On the Continent it is customary to speak of percentages when haemometer degrees of Sahli's new haemometer are meant; this is a source of much confusion.

P. H. M-B.

GORDON (A. H.). **A Case of Sprue.**—*Canadian Med. Assoc. Jl.* 1925. May. Vol. 15. No. 5. pp. 522–523.

There appears to be nothing remarkable about this occurrence of sprue in a Scotsman who had long resided in Cuba, save that he was treated with strawberries which he had to purchase " out of season."

P. H. M-B.

REVIEWS AND NOTICES.

DEEKS (W. E.). **Malaria—Its Cause, Prevention and Cure.**—30 pp. With 19 text figs., 1 map & 3 coloured plates. 1925. Feb. 16. United Fruit Company, 1 Federal Street, Boston, Mass.

In this pamphlet the main facts regarding the biology of malaria parasites and the causation and prevention and treatment of malarial fevers are brought together for the convenience of "physicians, sanitarians, social workers, school teachers and intelligent laymen." As is inevitable in a project where two such mighty opposites as conciseness of form and promiscuity of purpose are conjoined, many statements and explanations that impart quite sufficiently accurate impressions to the gentle reader will prove for the practitioner to be too unconditional or too ingeniously simple. On the whole, the facts are well and lucidly set forth, and it can only be owing to a sheer temporary oblivion that the parasite of benign tertian is set down as generally sporulating in the visceral capillaries and seldom in the peripheral blood.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 10

CHOLERA.

MAITRA (G. C.). **An Investigation into the Origin of Cholera Epidemics in the Jheria Coal-Fields.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 97–101. With 3 figs. [5 refs.]

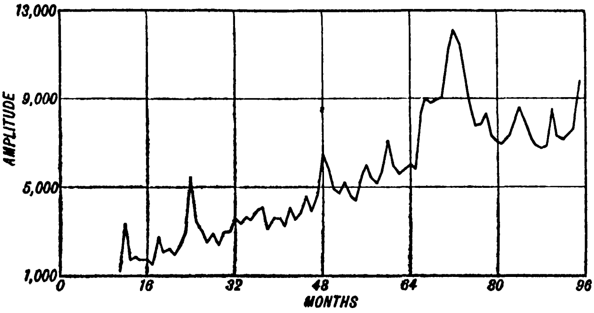
High case incidence and high mortality are noticeable only at certain seasons as shown in Chart No. 1. Since the great epidemic of 1919, with about 2,500 deaths out of 4,400 cases, no outbreak of similar magnitude has been known. But small annual epidemics occur even now, causing great panic among ignorant labourers, leading to wholesale desertion and temporary closure of the affected colliery. As the question was so important from the industrial point of view a small laboratory was opened at the Mudidih Hospital. Blood and dejecta of suspected cases are collected and examined. Plate I shows a microphotograph of a stained film of cholera stool and one of a film from a suspected case who ultimately died in the Mudidih Hospital. The original infection was introduced (July, 1923) by a pilgrim from Puri who " fixed a worshipping place " in the village Nero, where the epidemic started. There were 16 cases and 7 deaths. Cholera infection was imported last year into the coal-fields from the pilgrim centres of Puri and Baidyanath.

J. H. Tull Walsh.

i. RUSSELL (A. J. H.). **" Periodicity " of Cholera in India.**—*Lancet.* 1925. June 13. p. 1237. With 1 chart in text.

ii. ROGERS (Leonard): iii. KING (W. G.). **Periodicity of Cholera.** [Correspondence.]—*Ibid.* June 20. p. 1322: and June 27. p. 1369.

i. Recent bulletins issued by the Health Section of the League of Nations show that at the present time India is practically the only part of the world in which cholera exists in epidemic form. There can be no doubt that cholera has in India a regular seasonal periodicity. The author has applied the method of " periodiogram analysis " to the cholera deaths for the Madras Presidency for a period of 25 years, the statistics being arranged in three groups of districts, according to the periods in which these districts were affected by the different monsoons. In each of the three groups the annual periodicities are very apparent; but by far the highest amplitude is reached in each group at the 72-month period, which proves that cholera in Madras Presidency, for the period of years under examination, has gone through a regular six-year cycle.



Madras Presidency, Northern Districts Group: Graph showing monthly amplitudes of Cholera deaths over period 1902–21. [Reproduced by permission from the *Lancet.*]

From work done during the last two months the author states that the same six-yearly periodicity has occurred in Bombay Presidency, the Punjab, the United Provinces, the Central Provinces, and in Mysore for the years 1896-1923.

ii. Sir Leonard Rogers discusses the "six-year cycle" put on record by Major A. J. H. RUSSELL [above], and refers to his own work on "Bowel Diseases in Tropics," which contains a brief discussion of a "three-year cholera cycle" described, in 1885, by W. H. BELLEW: "History of Cholera in India." Reference is also given to a study of the Epidemiology of Cholera in Southern India by A. HERBERT, *Indian Med. Gaz.*, 1894. Sir Leonard has recently spent much time on a study of the epidemiology of cholera over a larger series of years than Major RUSSELL and hopes to be able to formulate that the major epidemics of cholera which originate in Bengal can be foreseen in time to allow sanitary measures to be taken to control the spreading of infection by pilgrimages and fairs. He finds the conditions giving rise to cholera epidemics are not quite so simple as any "three-year" or "six-year" cycles.

iii. Colonel King, referring to Major RUSSELL's paper, writes: This was the method employed by one of his predecessors in office in 1894, and formed the subject of a paper [" The Seasonal Prevalence of Cholera in the Madras Presidency," *Trans. First Indian Med. Congress* 1894]. This was illustrated by a diagram, founded on the figures of a decade; it inhibited monthly periodicity so markedly as in after years to justify it being termed the "Madras Cholera Clock."

A reference is also given to this *Bulletin,* 1919, Vol. 14, pp. 13–17.

J. H. T. W.

PALMER (F. J.). **The Treatment of Cholera by Cresol and Acid.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. p. 155.

In the *Indian Med. Gaz.* for August, 1924, the author published a a paper on the treatment of cholera by cresol [this *Bulletin,* Vol. 21, p. 885]. To combat possible acidaemia alkaline water was given *after* the acute choleraic symptoms had subsided. Although in the author's hands the results were very fair he was apprehensive that the exhibition of alkalies might not always be unfraught with danger. In two cases in out-gardens, in which the patients had, at first, appeared to do well, there was a suspicion that the set-back and subsequent fatal issue might have been due to the too early administration of alkali. The administration of alkalies at any stage of the treatment was discontinued, without, apparently, any loss of efficiency. Belief in the efficacy of dilute sulphuric acid as a prophylactic had been gradually strengthening. The author had speculated as to how much of the good effects of TOMB'S treatment was due to the acid that it contained [*l.c.* p. 885]. Its effect was tried with the cresol.

The following dosage was decided :—

1 to 3 years, cresol 1 m., acid sulph. aromat. 1 m., water 1 oz. ; 3 to 7 years, cresol 2 m., acid sulph. aromat. 2 m., water 2 oz. ; 7 to 12, cresol 3 m., acid sulph. aromat. 3 m., water 3 oz. ; 12 to 16, cresol 4 m., acid sulph. aromat. 4 m., water 4 oz. ; Adult, cresol 4 m., acid sulph. aromat. 5 m., water 4 oz.

The doses every quarter of an hour for the first eight doses and every half-hour for the next four. The acid is then omitted and the cresol dose given hourly, two hourly and three hourly on three succeeding days.

Nine cases were treated, all adults. Eight were collapsed when first seen ; in three no pulse even in the brachial artery. There were two deaths.

Acid sulph. dil. may be used instead of acid sulph. aromat., but is naturally lacking in the carminative properties of the latter. Dilute hydrochloric acid might prove equally useful.

J. H. T. W.

CHATTERJEE (S. N.). **Analysis of Two Latest Cholera Treatment.**—*Indian Med. Rec.* 1925. Apr. Vol. 45. No. 4. p. 107. [2 refs.]

The author gives his views on the cresol treatment only on theoretical grounds. He hopes the profession will give an equal chance to his kaolin-permanganate method of treatment. [See this *Bulletin,* Vol. 21, pp. 885–886 (PALMER) ; *ante* p. 385 (CHATTERJEE).]

J. H. T. W.

YOKOTA (Kiyoshi). **Zur Kenntnis der Arzneifestigkeit des Vibrio Nasik.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. June 8. Vol. 43. No. 3. pp. 224–235. [9 refs.]

The drugs used in these laboratory experiments were : Eucupin, methyl-blue, trypaflavin and pyoktanin. The author concludes that the vibrio is not drug resistant in Ehrlich's sense.

J. H. T. W.

DA COSTA (Aristides). **Resultados da vacinação anticolérica na luta contra o cólera em Damão.**—*Bol. Geral. de Med. e Farmacia.* Bastora. 1924. Aug. 9th Ser. No. 8. pp. 342–347.

The author's results have been very satisfactory. He considers anti-cholera vaccine one of the best means for preventing the disease. The vaccine used at Parel is prepared from vibrios taken from severe cases. The vibrios are passed through guineapigs, sown on agar and incubated for 18 to 48 hours. An emulsion of vibrios, in physiological salt solution, is exposed to a temperature of 55° C. for 15 minutes; 0·5 per cent. carbolic acid is then added. There have not occurred any unpleasant local or general reactions.

J. H. T. W.

SCHÖBL (Otto) & ANDAYA (Jose). **Cholera Vaccination; its Effectiveness as evidenced by the Presence of Antibodies in the Blood of Vaccinated Persons.**—*Philippine Jl. Sci.* 1925. Mar. Vol. 26. No. 3. pp. 311–316.

Six promptly agglutinable cholera vibrio strains were grown on acid agar and incubated at 37° C. for 24 hours. The cultures were emulsified in 30 cc. 5 per cent. glycerine in normal saline, heated in a water bath at 60° C. for 30 minutes, and then incubated at 37° C. for 10 days, being shaken vigorously several times a day. The anti-complement method was employed in the tests, using the anti-monkey system. Two units of amboceptor were used for the test proper. The conclusion was drawn that the dilution of the antigen to be used for the test proper should be 1 to 320, four times the dilution of the anti-complementary limit. Tables are given showing results after single doses of 500,000,000 and 1,000,000,000 tested 7 and 12 days after vaccination; and one table showing results after two injections of 500,000,000 and 1,000,000,000 with an interval of seven days, tested one week after the injections. The tests showed that antibodies persisted for six to ten months. The amount of antibodies stands in direct proportion to the amount of vaccine injected and to the number of injections given. Both the titre of the serum and the persistence of the antibodies depend on the number of injections to a higher degree than on the amount of the vaccine given. The wholesale vaccination in areas where outbreaks occur every year, as in places where sporadic cases occur during the off season, should be completed at least one month before the time when an epidemic may reasonably be expected to occur.

J. H. T. W.

MANALANG (Cristobal). **Agglutinin Formation following the Use of Castellani's Glycero-Vaccine.**—*Philippine Jl. Sci.* 1925. Mar. Vol. 26. No. 3. pp. 317–320.

A single dose of 1 cc. of Castellani's glycero-vaccine (cholera, 4,000,000,000; *B. typhosus,* 2,000,000,000; paratyphoid A, 1,000,000,000; paratyphoid B, 1,000,000,000) produced anticholera agglutinin in 37 of 43 vaccinated persons. The agglutinins appeared in 24 cases between the ninth and fourteenth days after a single injection. Six cases remained negative for 160 days of observation. Of the 37 positives agglutination became negative in 20, in dilutions of 1-20, within 160 days after vaccination. In more than 50 per cent. of these cases agglutinins were present in the blood of vaccinated persons for a period of three to four months. The formation of agglutinin in the blood of persons injected with Castellani's vaccine was more satisfactory than that obtained with the usual saline vaccine used in single 1·0 cc. doses (cholera, 1,000,000,000; *B. typhosus,* 500,000,000; paratyphoid A, 250,000,000; paratyphoid B, 200,000,000). The reactions, local and general, were practically the same as those from saline vaccine, considering the number of bacteria given. The vaccine was given to at least 40,000 people, and not a single mishap was reported.

J. H. T. W.

KLÜCHIN (S.) & VIGODTSCHIKOFF (G.). **Experimentelle Bewertung der Choleravakzinationsmethode per os.**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 20. Vol. 94. No. 1. pp. 6–15. [13 refs.]

—— & ——, **Weitere experimentelle Untersuchungen ueber die Enterovakzination gegen Cholera, Typhus abdominalis und Dysenterie.** [Experiments with Oral Vaccination against Cholera, Enteric Fever and Dysentery.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. Feb. 16. Vol. 42. No. 2. pp. 98–104.

As the result of these experiments the authors conclude that for enteric fever, as also for cholera, entero-vaccination after Besredka's method, with bile-sensitization, is not confirmed by experiments, and that oral vaccination is of no practical value.

J. H. T. W.

MELNIK (M.). **De la virulence des vibrions cholériques en rapport avec l'âge des cultures.**—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 941–943. With 1 chart in text.

Using cultures of *V. cholerae* on agar and bouillon the author carried out a series of experiments on guineapigs. He found that cultures on agar give a maximum virulence when 16 hours old, cultures on bouillon when 4 days old. The curve of virulence (charted) on agar rises and decreases rapidly. That of the cultures on bouillon increases more slowly, is maintained longer and decreases slowly.

J. H. T. W.

ZDRODOWSKI (P.) & BRENN (H.). **[On the Pathogenesis of Cholera and the Algid State. An Experimental Investigation.]**—*Trav. Inst. Microbiol. et Hyg. d'Azerbaidjan* (Baku). 1924. No. 1. pp. 1–40. [In Russian.]

The first part of this paper is devoted to a detailed review of SANARELLI's investigations on the same subject (this *Bulletin*, Vol. 21, p. 72; *ante*, p. 391). In the second part the authors record their own studies, the main object of which was to investigate the algid state on the basis of the results obtained by SANARELLI. The experiments were carried out on 100 rabbits. The authors confirm SANARELLI's conclusions regarding the enterotropism of cholera vibrios, having succeeded in all cases of intravenous and intraperitoneal inoculation in producing an infection of the small intestine. [A well-known phenomenon.] They have also reproduced SANARELLI's phenoma of algidity in rabbits. SANARELLI's contention that algidity is due to an interaction between the cholera vibrio and *B. coli* was tested by vaccinating one group of rabbits against cholera, and another against *B. coli*. In both cases attempts to reproduce the algid phenomenon failed, and the authors conclude that "vaccination of rabbits against cholera and the colon bacillus is capable of protecting the animals against SANARELLI's phenomenon"; further, it illustrates the correctness of SANARELLI's views.

Similar effects were produced by repeatedly inoculating rabbits with the killed cholera culture, the colon bacilli in this case being activated by the proteins of the vibrios. In another series of experiments the authors have shown that a state of algidity can be induced in rabbits by *B. coli* alone. In these experiments an intravenous injection of living coli cultures was followed 24 hours later by the introduction of "coli-toxin." The authors regard this experiment as a corroboration of SANARELLI'S view, according to which the "algid syndrome" is not a "choleraic," but a "para-choleraic" phenomenon.

C. A. Hoare.

i. FUJII (Shyukyoku). **[On the Quantitative Oscillation of the Reducible Substances in the Blood and Cerebrospinal Fluid in Experimental Cholera.]**—*Chugai Ijishimpo* (*Cent. Med. Jl.*). 1925. Feb. Vol. 44. No. 3. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. p. 102.]

ii. ——. **[A Study on the Combined CO_2 Contents of the Blood and Cerebrospinal Fluid of Experimental Cholera.]**—*Ibid.* No. 4. [*J.M.W.* p. 102.]

i. Administering cholera toxin to the guineapig or dog either intravenously or hypodermically, the author found that there developed a marked lowering of the sugar contents of the blood and cerebrospinal fluid with time differences in either case. Death took place with production of the lowest sugar concentration in both fluids. The prognosis is good when the sugar concentration rises. The author, therefore, suggests the use of glucose in the soda solution or saline injection in the treatment of human cases, as better than Ringer's or Locke's solutions.

ii. The author injected cholera vaccine [? toxin] into the dog. He could produce symptoms very similar to those in human cases. He also estimated the sugar contents of the blood and cerebrospinal fluid and found that in the early stage of the disease acidosis developed. From clinical view-points he concludes that the test of cerebrospinal fluid for acidosis may suggest to the clinician to abort hyperglycaemia or hypoglycaemia: in other words whether he should inject soda or saline alone or mixed with glucose.

J. H. T. W.

PLAGUE.

PATERSON (A. R.). **Notes on the Incidence of Plague in Kenya in Relation to a Recent Migration of Rodents, and on an Experiment in Eradication carried out by a Native Tribe.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 591–612. With 4 figs. [2 refs.] [United Fruit Company, Boston, Mass.]

The author describes the geography of Kenya Colony and gives a history of plague in the countries bordering on the Victoria Nyanza. To-day plague is endemic over a large area of the Kikuyu country in the Highlands of Kenya and also over a large part of the Nyanza Province, of which Kisumu is the capital. The three species of "domestic" rodents in Kenya are :—

1. *Rattus rattus kijabius* } (*Mus rattus.*)
   „ „ *frugivorus* }
2. *R. coucha ugandae,* known as the "*multimmate*" rat since the female bears 10 pair of mammae as against the 5 pairs characterizing *M. rattus.*
3. *R. norvegicus* (*M. decumanus*) ; comparatively unimportant.

Two map diagrams are given showing the infected area and area of distribution of *R. rattus kijabius* prior to and in 1913. Two other maps show the distribution of "domestic" rats and of plague in 1921. The population consists of primitive Africans living in round huts with mud walls and grass roofs. The staple food is grain, stored in small grass-roofed granaries close to the huts. Conditions for house rats are ideal ; it would appear that the average rat population of each hut is about 15, and as many as 60 rats have been killed in one hut. The story of the campaign against the rats which has lasted for three years is interesting. The people are fairly active in killing rats. But, although the total rat population has been reduced, it is not possible, at present, to show a corresponding diminution of plague.

J. H. Tull Walsh.

HUNTER (R. N.). **Plague in Kenya. (From the Records of the Medical Department).**—*Kenya Med. Jl.* 1925. June. Vol. 2. No. 3. pp. 75–85.

The origin of plague in Kenya and period at which it appeared are unknown. Continued absence of plague from Mombasa suggests that the disease was not imported from India. The relation of geographical and meteorological conditions is unknown. The disease is primarily a disease of rats and the occurrence of human cases is in direct relation to rodent plague. The rats involved are : *R. rattus norvegicus, R. rattus kijabius* and *frugivorus.* There are areas of country in which plague is never absent for any considerable time ; from time to time epizootics and epidemics occur. Rats travelling in grain or other merchandise, by train or otherwise, may play a part in the spread of plague. It is not known what are the fleas or other insect vectors. The disease is mostly bubonic in type, septicaemic and pneumonic cases are common, true inspiration pneumonia is rare. The mortality is usually about 75 per cent. Prophylaxis is a matter of separating man and his food from the rat by applying sanitary principles, the chief of which is housing. No known methods of rat destruction are sufficiently effective to influence permanently the rat population. Quarantine and segregation have little effect in the control of the disease. Inoculation with anti-plague vaccine is valuable as a means of personal protection only.

J. H. T. W.

RAYNAUD (Lucien). **La peste en Algérie. Epidémies de peste dans la régence d'Alger. Cas de peste survenus dans la colonie de 1899 à 1924.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Sept. Vol. 2. No. 3. pp. 303–361. With 5 charts on 3 folding plates & 4 charts in text. [73 refs.]

The author considers the various epidemics of plague before the French occupation and subsequently, giving, so far as is possible, statistics of cases and of mortality. He points out that to other advantages which France has given to the people of North Africa means of defence against plague may be added. From an epidemiological point of view bubonic plague is the most common form and is, as in general, the least fatal. When a patient is brought—or walks—to hospital with enlarged inguinal glands and little fever the case may be mistaken for adenitis due to some other infection and a bacteriological examination should always be made. Cases of pneumonic plague, primary or secondary, occur in general, mixed epidemics; or may appear in small isolated epidemics among families. Several examples of such epidemics are recorded. Septicaemic plague occurs with rapid death. Dr. Raynaud believes that bubonic plague may spread from man to man by means of fleas infected from a human source, *e.g.*, *Pulex irritans.* He gives references in support of this belief. Table 7 gives, in diagrams, the percentage of fleas found on rodents in 1908–1909 in Algiers and Constantine; *Pulex* [*X.*] *cheopis*, 59 per cent. and 39 per cent.; *Ctenopsylla musculi*, 20 per cent. and 37 per cent.; *Ceratophyllus fasciatus*, 13 per cent. and 23 per cent.; and *Ctenocephalus serraticeps*, 6 per cent. and 4 per cent. The author holds that every ship should be freed from rats at least twice a year.

J. H. T. W.

COUVY. **Organisation de la lutte contre la peste dans la commune de Tananarive.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 33–49.

The author reviews the progress of plague, in and around Antananarivo, from 1921 onwards. He describes the sanitary methods adopted, or necessary, for the prevention of the disease: Rat-proof houses and stores for grain or other food; destruction of rats by various methods; the keeping of all waste, from slaughter houses, markets, etc., in covered metal bins pending destruction, and notes the value of anti-plague vaccination. [*v.* this *Bulletin*, *ante* p. 376 (AUGAGNEUR); Vol. 21, p. 876 (THIROUX), p. 445 (CACHIN).]

J. H. T. W.

HOOD (Alexander). **A Small Outbreak of Pneumonic Plague.**—*Jl. Roy. Army Med. Corps.* 1925. June. Vol. 44. No. 6. pp. 459–460. [1 ref.]

The author records an outbreak of primary pneumonic plague among the Indian servants of the Soldiers' Home, Upper Topa, Murree Hills.

On the evening of Sept. 22 (?19) a sick man arrived at the servants' quarters from Rawalpindi. Eight servants sat with him all night. Next morning he was carried away on his charpoy and his further history is unknown. There was plague at the time in Rawalpindi. On the evening of the 24th the eight servants were complaining of "fever." Major Hood saw these patients on the 25th. "As soon as one entered the first patient's godown the likelihood of an infectious pneumonia presented itself and one departed hurriedly to don mask, gown and gloves before making further examination. The reasons were: Firstly, the sputum, which was unlike any one had seen, resembling pure serum streaked with blood and slightly frothy, deposited all over the floor of the room; secondly, the look of horror on the patient's face, not a look of anxiety, but sheer dread. Examination showed all eight to be in much the same condition. The look of horror was present in all, in different degrees. The physical signs in the chest were in all cases well marked, coarse bubbling râles being a feature. No buboes were present. The progress of the disease was dramatic, intense dyspnoea and prostration; and by September 27th all the eight were dead. Diagnosis had been confirmed by finding the sputum full of *B. pestis.*" Isolation sufficed to protect all the attendants on the sick and the surrounding population. No further cases occurred. The outbreak is of interest because it was so definite. The infection could only have come from the sick man passing through . . . there were no other plague cases nearer than Rawalpindi, 40 miles by road.

J. H. T. W.

TEISSIER (P.), REILLY (J.), CAMBESSÉDÈS & CATHALA. **Forme exanthématique de la peste bubonique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. June 4. Year 41. 3rd Ser. Vol. 49. No. 19. pp. 824–831.

The authors describe, in detail, a case of bubonic plague with a general pustular eruption like smallpox. The patient, a groom aged 35, was admitted into the Claude-Bernard hospital on October 4th, 1924, as a case of smallpox. On admission the temperature was 38° C.; there were painful, inflamed glands in the neck below the angle of the jaw and a general pustular eruption. Puncture of the glands and examination of the fluid from the pustules gave evidence of the presence of *B. pestis.* The diagnosis was altered and serum treatment given. On October 6th the buboes and eruption were increased and the temperature, in spite of the serum treatment, was 39·6° C. In addition to the inflamed glands in the neck there was inflammation around the glands in the right inguinal region and one large bubo. The left groin was also affected. The patient steadily became worse, with high fever (40·2° C. and 41·2° C.) and delirium. He died on October 7th. Owing to special rules for contagious diseases the autopsy was performed an hour and a-half after death. The lungs were congested and contained haemorrhages and infarcts. The liver was pale with necrotic spots and the spleen showed a necrotic abscess; minute abscesses were also found under the cortex of the kidneys. Bacteriological examinations proved that it was a case of plague. Anti-plague serum was given in sufficient doses, but evidently not in time, as the man had been ill for some days before he was admitted to hospital and the disease rightly diagnosed.

J. H. T. W.

URIARTE (Léopold). **La ponction ganglionnaire dans la peste bubonique.**—*C.R. Soc. Biol.* 1925. Mar. 27. Vol. 92. No. 11. pp. 901–903. [1 ref.]

The author's experience leads him to believe that in cases of glandular buboes when diagnosis is doubtful puncture of the glands is unsatisfactory. He advocates removal of the glands. They are then ground up and mixed with physiological salt solution for inoculation into guineapigs. They are also carefully cut into sections for microscopic examination and for cultures. In 7 cases in which puncture of buboes had failed to provide a diagnosis, extirpated glands supplied cultures and infected guineapigs with Yersin's bacillus. In 10 other cases where puncture proved negative positive results were obtained in two cases.

J. H. T. W.

CHOKSY (N. H.). **The Diagnosis of Pneumonic Plague.** [Correspondence.]—*Brit. Med. Jl.* 1925. July 4. pp. 37–38.

The writer refers to the early diagnosis of pneumonic plague and plague pneumonia as at times beset with considerable difficulty in the absence of physical signs during life, and also of the characteristic sputum, etc. At the autopsy, however, deep-seated and localized foci of infection or infarcts, or even solid consolidation, may be found and give pure cultures of the *Bacillus pestis.* [*v.* this *Bulletin,* Vol. 22, p. 376 (SHARP); Vol. 21, pp. 876–877 (COLOMBANI); Vol. 21, pp. 443–444 (JORGE); Vol. 20, pp. 743–744 (TSURUMI & others); Vol. 19, pp. 542–543 (Review).]

Dr. Choksy records "an isolated instance of plague pneumonia causing infection of the bubonic type. . . . . An English plague nurse working at the Arthur Road Hospital (Bombay) had severe coryza with injected eyes, and was advised to rest. Whilst bending over a bubonic plague patient to feed him he happened to cough and some sputum went into one eye. Within two days she developed parotid and cervical buboes with considerable oedema of the neck and pharynx; oedema of the glottis soon supervened, and death occurred within five days."

J. H. T. W.

FRANÇA (C.). **Au sujet de la peste pulmonaire primitive, à propos de la communication de J. Renaud.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. p. 16.

J. RENAUD had suggested that in primary pneumonic plague outbreaks there existed specially pulmonotropic strains of *B. pestis*—"races pulmotropes." Dr. França remarks: If I were present during an epidemic of pneumonic plague I should isolate the germ and test the matter of special lung-tropism by means of subcutaneous inoculations into receptive animals. I find it more natural to admit the possibility of pulmonotropic races of the bacillus than to accept the theory of association of bacteria as the cause of pneumonic plague put forward by R. JORGE, Norman WHITE and Ch. NICOLLE. [*ante,* p. 376, NICOLLE.]

J. H. T. W.

DI MATTEI (Eugenio). **Su di alcuni casi di polmonite diplococcica in individui pestosi.**—*Policlinico.* Sez. Med. 1925. Mar. 1. Vol. 32. No. 3. pp. 117–132. [23 refs.]

During the outbreak of plague in Catania during 1921 three fatal cases clinically diagnosed as lobar pneumonia attracted the author's attention owing to the bacteriological conditions. All three cases occurred in one family (daughter, mother, father) and are described at length. In case No. 1 (daughter) numerous diplococci of Fraenkel were found, but no plague bacilli. Inoculated into a guineapig, material from this case gave Fraenkel's diplococcus. Case No. 2 (mother) showed exclusively the same germ in the lungs ; in the spleen a few bacilli like *B. pestis* were present. An inoculated guineapig died in 48 hours. In this animal plague bacilli were found in addition to the pneumococci. Case 3 (the father) showed only Fraenkel's diplococcus from the lungs. In the blood of the heart and in the spleen there were a few plague bacilli. A guineapig inoculated from this case died in 16 hours. The author considers the question of the true cause of the pneumonia and whether these were cases of true pneumonic plague. He gives numerous references to cases in which various germs have been found with plague bacilli.

J. H. T. W.

KARSENTY (André). **Conception moderne de l'épidémiologie de la peste. Les réservoirs du virus pesteux.**—*Médecine.* Paris. 1924. Dec. Vol. 6. No. 3. pp. 226–231. [4 refs.]

The author compares the classical conception, that the plague-infected rodent is the propagator of the disease, and that the epidemic is subordinate to the epizootic conditions, with the modern conception of reservoirs of plague infection in carriers. This conception, he thinks, explains the variations in severeness of epidemics and is the interpretation of the recurrence of plague in old foci. Since man, apparently healthy, may harbour the plague bacillus it is indispensable, in French Africa, to make a bacteriological examination of all natives with buboes who may be carriers. [See this *Bulletin,* Vol. 21, p. 878 (LEGER & BAURY).]

J. H. T. W.

WU LIEN TEH, CHUN (J. W. H.) & POLLITZER (R.). **Plague Transmission through the Ectoparasites of the Tarabagan.**—*Amer. Jl. Hyg.* 1925. Mar. Vol. 5. No. 2. pp. 196–201. [10 refs.]

The authors, working experimentally with the tarabagan flea—*Ceratophyllus silantievi*—and the tarabagan louse (identification not certain : either *Haematopinus lyriocephalus* Burmeister, or *Linognathoides spermophili* Cunnings 1914) record the following conclusions :—

> "Now that we have finally succeeded in infecting a healthy animal [guineapig] by means of tarabagan fleas, it may be stated that they undoubtedly play an important part in the spread of the infection, not only from animal to animal, but also from animal to man ; we are convinced that they were involved not only in the constant Siberian outbreaks, but also in others where a direct contact with the infected animals occurred. The lice are certainly an important link in the propagation of the disease from animal to animal—our observation on the lice and fleas from one and the same naturally infected tarabagan

is certainly illustrative in this respect. It is at present difficult to gauge how far the lice actually spread the disease to man. A few outbreaks, where the affected had contact with tarabagan skins only, seem somewhat suggestive of their rôle. Our observations, made both on the fleas and the lice, thus show that any attempt to control the handling of tarabagans and the trade with their skins must include not only bactericidal, but also insecticidal measures."

Experiments with the tarabagan tick (*Rhipicephalus* (*R. haemaphysaloides* ?)) gave negative results.

J. H. T. W.

i. ORLOV (E. I.). *Cynomys fulvus* **Licht. I. Biological Observations.**—*Rev. Microbiol. et Epidémiol.* Saratov. 1925. Vol. 4. No. 1. English summary pp. 91–92. In Russian pp. 58–65. With 3 text figs.

ii. NIKANOROV (S. M.). **Significance of** *Cynomys fulvus* **Licht. as a Carrier and Transferrer of Plague Infection.**—*Ibid.* English summary pp. 93–94. In Russian pp. 66–69. With 1 chart in text.

i. The recorded observations on the natural history of *Cynomys fulvus* were made in 1924 in the steppes adjoining the Volga on the right and left banks of the river Eruslan near Diakovka.

ii. Under experimental conditions *C. fulvus* is very susceptible to plague. *B. pestis* is always found in great numbers in the blood and organs. Serious epizootics have not, however, been observed among them under natural conditions. Their rôle in carrying and transfer of plague to man cannot be of any consequence.

J. H. T. W.

DI MATTEI (Eugenio). **Difficoltà ed incertezze nella diagnosi batteriologica della peste dei murini. (Osservazioni e Ricerche.)**—*Ann. d'Igiene.* 1925. Mar. Vol. 35. No. 3. pp. 201–210. [1 ref.]

The author reviews, at length, the various laboratory methods used in the diagnosis of plague and the detection of *B. pestis.* He finds that in certain cases it is very difficult to make an absolute diagnosis even when it is fairly certain that a given rat is, like others, a plague carrier. The author gives certain detailed experiments as examples of the difficulty.

J. H. T. W.

STEVENSON (W. D. H.) & KAPADIA (R. J.). **Experiments on the Onset of Immunity after Inoculation with Haffkine's Anti-Plague Vaccine. The Absence of a "Negative Phase."**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 553–559. [5 refs.]

The two series of experiments, in which 560 rats were used, show: (1) That there is no " negative phase " or period of increased susceptibility of rats to plague after the administration of anti-plague vaccine, even within one and a-half hours after the operation; (2) that the production of immunity among rats commences within a few hours of inoculation and increases in amount till the 2nd or 3rd day after anti-plague vaccination. Fourteen days after inoculation—the limit of experiment—a considerable degree of immunity is still present.

J. H. T. W.

RAYNAL (G.). **Essai de vaccination antipesteuse par voie buccale chez l'homme.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 235–238. [4 refs.] (Discussion pp. 239–241.)

The author begins his paper with references to the results of other investigators, concluding, with NICOLLE and CONSEIL, that the addition of bile to an oral vaccine is not necessary. The vaccine used by Dr. Raynal is called " Pestedo," and is in the form of " gelodiscs " which quickly become liquid in the intestine. They do not contain bile. Forty-eight Africans swallowed 7 discs daily for 3 days and were under the author's observation. Thirty were prisoners employed, more or less, in conveying sick to the hospital, or the dead to the burial ground. Eighteen were patients, mostly convalescent from diseases other than plague, in the hospital for natives. Two cases died, one during the period of oral vaccination, the other three days after. The rest, although more or less exposed to the chances of infection, remained healthy throughout the epidemic. During the discussion M. DUJARDIN-BEAMETZ remarked that the value of oral vaccination is not finally settled and that it would be dangerous to substitute that method for subcutaneous anti-plague inoculation. M. Marcel LEGER agreed that the question is not yet settled.

J. H. T. W.

i. MARUYAMA (Y.). **Ueber die Beziehungen zwischen Wachstum und Toxinbildung der Pestbazillen und der Wasserstoffionenkonzentration der Kulturflüssigkeit.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Mar. No. 240. German summary p. 20. [In Japanese.]

ii. ——. **Experimentelle Untersuchungen ueber die Giftigkeit der Pestbazillen und ueber dieselben als Antigene.**—*Ibid.* 1925. Jan. No. 238. German summary pp. 1–5. [In Japanese.]

iii. KOSUGE (J.). **Histologische Studien an Pestbubonen.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1924. Vol. 253. No. 1/2. pp. 505–510. With 4 figs.

i. The author experimented with 10 races of *B. pestis* seeking the optimal hydrogen-ion content for growth and the changes occurring with change of pH. He found that the strongest toxin virulence occurred with pH 8·0 to pH 8·2 [*v.* this *Bulletin*, Vol. 21, pp. 444–445. (D'AUNOY).].

ii. Detailed laboratory experiments on animals. Does not contain anything new.

iii. It is hardly necessary to describe the histology of the plague bubo ; but the work has been carefully done and the four micrographs are good.

J. H. T. W.

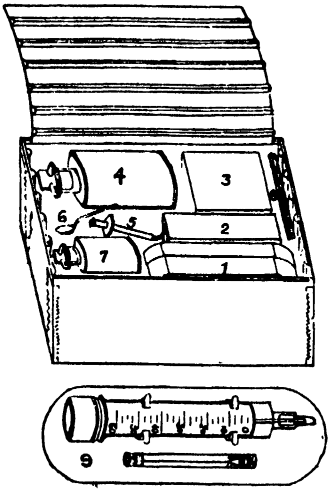
LABORATORY METHODS.

Simon (Charles E.) & Scott (Joseph M.). **The Paul Test in the Diagnosis of Smallpox.**—*Jl. Lab. & Clin. Med.* 1925. Apr. Vol. 10. No. 7. pp. 562–569. With 7 figs. on 2 plates. [12 refs.]

The authors have previously [this *Bulletin*, Vol. 21, p. 330] drawn attention to the value of the Paul method of diagnosis of smallpox, an account of which was given in this *Bulletin*, Vol. 19, p. 440. The present article emphasizes the conclusion that, histologically controlled, the method is reliable and deserves general application. The material used in the examination, dried exudate, etc., retains its infectivity for some time, and the authors [at Baltimore] have received specimens from China, which still retained their virulence. In one instance the virus was found to retain its activity in a dried drop preparation, at ice-box temperature, for 387 days.

The authors have now applied the Paul test to 247 examinations; in 44 out of the 45 cases of smallpox, the macroscopic reaction was in itself sufficient for diagnosis. In chickenpox, negative results are so constant that a doubtful reaction is suspicious and calls for further examination. Pyogenic infections of the rabbit's cornea *per se* do not interfere with the reaction. A negative macroscopic result will probably always warrant a negative diagnosis as to smallpox, if satisfactory material is available for the examination.

Finally, in view of the confirmed observation that the virus may be demonstrated in the nasopharyngeal secretion of convalescents, the authors advise that a careful rhinoscopic examination should



1. Metal case containing syringe and platino-iridium needle.
2. Cardboard box containing tablet phials.
3. Cardboard box containing " Vaporole " capsules.
4. Bottle containing methylated spirit.
5. Bazaar-made burner with wick.
6. Tea spoon.
7. Bottle containing glycerine of carbolic acid and rectified spirit.
8. File.
9. View of syringe and needle in open metal case.

[Reproduced from the *Indian Medical Gazette.*]

be made in all smallpox cases before releasing them from quarantine, followed, if necessary, by the application of the Paul test to the nasopharyngeal secretion.

E. Hindle.

TOMB (J. W.). **A Useful Hypodermic Outfit.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 32–33. With 1 text fig.

Description of a cheap and efficient hypodermic outfit for colonial and rural practice. The whole is contained in a stout cardboard box about 7½-ins. by 4 ins. by 2½ ins., lined with corrugated cardboard and half filled with cotton wool to protect the contents. The various articles and their arrangement in the box are shown in the accompanying sketch.

E. H.

VINCENT (Maurice). **Seringue pour prélèvement d'échantillons de sang à l'abri de l'air.**—*C.R. Soc. Biol.* 1925. Apr. 10. Vol. 92. No. 13. pp. 1022–1024. With 1 text fig.

Description of an ingenious syringe, prepared by Ad. CHATELLIER, by means of which specimens of blood can be removed from the body and centrifuged without exposure to air, and with the minimum exposure to paraffin. The original article should be consulted for details.

E. H.

CURASSON (G.). **Sur la toxicité du chinosol employé comme agent conservateur dans les sérums thérapeutiques.**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 221–222. [1 ref.]

Chinosol, or quinosol, recommended by NICOLLE for the preservation of serum, possesses the advantages of being a very strong antiseptic, and also producing no appreciable change in the serum to which it is added. Ordinarily it is employed in the proportion of 0·2 per cent., but at Bamako [West Africa] the author uses 1 per cent., and finds that this is more satisfactory, in order to counteract the mistakes in sterilization often made by the native staff. Two per cent. was employed last year, but the injection of large doses, especially when administered intravenously, caused the death of certain animals. When employing sera preserved in this manner, therefore, it is important to remember the toxicity of chinosol.

E. H.

ORPEN (L. J. John). **The Use of Saturated Organisms (Saturation Test) in Diagnosis.**—*S. African Med. Rec.* 1925. Mar. 28. Vol. 23. No. 6. pp. 120–121.

A test depending on the curious fact that when a serum is heated to a certain point the agglutinating components of its agglutinins are destroyed, while the combining components are left intact, so that an organism treated with such serum is not agglutinated by it, and, moreover, cannot subsequently be agglutinated by a similar unheated serum. The temperature required to produce this change has not been worked out in detail; 70° C. for one hour is insufficient, whilst above 80° C. the combining properties of the serum are destroyed.

The application of this test in a suspected typhoid case which agglutinates both typhoid and paratyphoid is as follows :—

"A known typhoid organism is kept in stock which has been saturated with heated paratyphoid serum, and consequently only agglutinates with typhoid. This organism is put up against the patient's serum in a single dilution of any fairly low titre. A positive result can only mean typhoid. Similar tests would be made, as usual, at the same time with paratyphoid or other organisms similarly saturated with allied sera."

The details of this test have not yet been elaborated, but it promises to give a simple and rapid method of diagnosing such infections as typhoid, melitensis, etc.

E. H.

DAVIS (Gordon Ernest). **A Note on the Destruction of Complement in Human Serum by Heating at 55° C. for Fifteen Minutes.**—*Jl. Lab. & Clin. Med.* 1925. Mar. Vol. 10. No. 6. p. 475.

Five hundred sera of routine blood specimens received for the Wassermann test were heated at 55° C. for 15 minutes only, instead of from 20 to 30 minutes as formerly used. The results clearly showed that the shorter period is sufficient to destroy the complement in human serum.

E. H.

DRY GUINEAPIG COMPLEMENT.

The attention of laboratory workers is called to a preparation of dry guineapig complement, which is stated to be reliable and uniform in strength and to keep well almost indefinitely. The liquid complement is prepared by dissolving 1 part in 9 parts of water. Dr. H. B. NEWHAM informs the writer that he has tested this preparation for Wassermann reactions against ordinary complement from fresh guineapigs' blood, and obtained exactly parallel results. The preparation is supplied by the Pharmaceutisches Institut Ludwig Wilhelm Gans A.-G., Oberursel, Germany.

E. H.

THRO (Wm. C.). **Modifications of the Sahli Hemoglobinometer.**—*Jl. Lab. & Clin. Med.* 1925. Mar. Vol. 10. No. 6. pp. 491-493. With 1 text fig. [1 ref.]

The chief fault of the "Sahli" is the fading of the colour standard, so the writer has devised certain alterations in the instrument. The tube containing the standard colour is made like a small test-tube with an accurately gauged bore, 7 mm. in diameter, and closed with a rubber stopper. The standard haematin solution is composed of oxalated blood, 1 cc. ; HCl tenth normal, 30 cc. ; and glycerine, 69 cc. This solution is poured into the tube, and if it fades can be easily renewed.

When making tests a 1 per cent. acid haematin solution of the blood is poured into a flask and well shaken, and then placed in the colour tube and compared with the standard in the usual manner. It has been found advantageous to bring the colour tube and the graduated tube closer together (1 mm. apart), and to hide the entire length of the tubes with the exception of an aperture 16 mm. square covered with a piece of ground glass. With these modifications the writer finds the Sahli is one of the best haemoglobinometers, and gives results of examinations of the blood of students supporting this view.

E. H.

ROBIN (A.). **Sur une nouvelle méthode d'enrichissement des selles.**—*C.R. Soc. Biol.* 1925. May 1. Vol. 92. No. 14. pp. 1099–1100.

A modification of Téléman's method of concentrating faeces for the examination of cysts and ova. Finding that fragments of cellulose interfere with this examination the author recommends the application of Schweitzer's reaction to the faeces, in order to dissolve the cellulose. The complete method is as follows :—

(1) Introduce about 14 cc. of Schweitzer's reagent [ammoniacal solution of hydrated cupric oxide] into a flask containing 20 glass beads, and then add a small portion of faeces (2-3 gms.) and shake the flask until the contents are thoroughly mixed.

(2) Pour the liquid into two centrifuge tubes and centrifuge for about one minute.

(3) Throw away the supernatant liquid and wash the tubes in water without disturbing the sediment ; then add to each tube 4 cc. of saline and shake well.

(4) Filter through a metal gauze with apertures of 340μ, into a wide-mouthed flask.

(5) To each 4·5 cc. of the mixture add HCl 22 cc. ; formol, 34 cc. ; saline, 44 cc. Shake for 15 seconds ; then add 12·5 cc. of ether, and shake for another 15 seconds.

(6) Pour the mixture into centrifuge tubes and centrifuge for about a minute. Pour out the liquid and examine the sediment.

With this method protozoal cysts and eggs of helminths are very clearly shown, and are said to be very little modified in their form and structure.

E. H.

ASHESHOV (Igor-N.). **Sur un mode avantageux de préparation des milieux de culture.**—*C.R. Soc. Biol.* 1925. Feb. 13. Vol. 92. No. 5. pp. 360–361. [1 ref.]

The author recommends a culture medium said to be cheaper and to give better results than those of MARTIN and DOUGLAS, which are based on the employment of the products of albuminoid digestion. The medium is prepared as follows :—

One kilo of minced lean meat is mixed with 1,000 cc. of 1 per cent. HCl containing 5 gms. of Pepsin [Merck 1 : 100]. The following day the mixture is neutralized by the addition of 10 per cent. Na OH, and then gradually heated to 80° C., keeping the mixture stirred the whole time. Then it is suddenly cooled ; and after 1-2 hours the clear liquid decanted off. This is the " Peptonized part." The residue is again minced, preferably with 100 gm. of liver, but this is not essential. Na OH is then added until the mixture is alkaline, and then 5 gm. of " Pancreatinum absolutum U.S.P.IX Merck." Chloroform is added as an antiseptic and the mixture allowed to digest for 5 to 7 days. This " tryptamine part " is then mixed with the " peptonized part " and the mixture sterilized. The liquid is finally decanted off and constitutes the concentrated broth, which, before use, is diluted so that each 100 gm. of meat employed gives one litre of broth.

E. H.

i. LAIDLAW (P. P.). **On Structures which develop in Certain Culture Media and resemble Colonies of Micro-organisms.**—*Brit. Jl. Experim. Path.* 1925. Feb. Vol. 6. No. 1. pp. 36–39. With 1 plate. [1 ref.]

ii. BARNARD (J. E.). **Cultures from Single Cells.**—*Ibid.* pp. 39–40. [2 refs.]

i. The formation of artificial colonies on the surface and in the depths of certain culture media, originally described by F. W. TWORT and D. N. TWORT, is described in detail, and the author shows that the artefact is due to the separation of calcium and magnesium soaps out of the medium.

ii. A method of growing bacterial colonies, etc., from single organisms. The organism or cell to be grown is spread on a slide and then covered with a selenite cover glass. The organism or cell to be cultivated is then covered with a minute drop of mercury on the cover glass and the preparation exposed to a bactericidal light source, such as a mercury vapour lamp. The mercury protects the organism underneath it from the action of the rays, but all the others are killed. The cover glasses can be obtained from Messrs. Hawksley & Sons, 83, Wigmore Street, W.

E. H.

BATTAGLIA (Mario). **Metodo per colorare i tripanosomi nei tessuti fissati. Nota di tecnica microscopica.** [A Method of Staining Trypanosomes in Fixed Tissues.]—*Pathologica.* 1925. Jan. 1. Vol. 17. No. 387. p. 23.

The author recommends a modification of the Koch-Ehrlich-Gram method.

The tissues are fixed and paraffin sections prepared in the usual way. The sections are stained for two hours in Carbol Gentian Violet (1 cc. of a saturated alcoholic solution of the stain to 100 cc. of ·2 per cent. phenol in distilled water); then passed into Lugol's iodine solution (iodine, 1 gm.; potassium iodide, 2 gms.; distilled water, 300 cc.) for one hour, the solution being changed two or three times; then into absolute alcohol until no more colour comes out, and finally mounted in balsam.

The trypanosomes are said to be stained very clearly, periplast, nuclei, granules, etc., being coloured brownish violet, whilst the ectoplasm is a pale blue.

E. H.

RAMÓN y FAÑANÁS (J.). **[El método de Ramón y Cajal, al urano-formol, aplicado a la coloración de microbios y parásitos en los tejidos.]**—*La Medicina Canaria.* 1924. Nos. 8 & 9. [Summarized in *Rev. Española de Med. y Cirug.* 1925. Jan. Vol. 8. No. 79. pp. 31–32.]

The following method for staining bacilli and parasites in tissues is described: Pieces, 2-2·5 mm. thick are fixed for 8-24 hours in a solution containing uranium nitrate 1 gm., neutral formol 15 cc., in distilled water 100 cc. They are then rapidly washed in distilled water and placed in a solution of silver nitrate 0·75-1·5 per cent. (according to the thickness of the fragment) for 24-72 hours at room-temperature; after being again rapidly washed in distilled water they are placed in a reducing bath of hydroquinone 2 gm., formol 6 cc., anhydrous sodium sulphite 2·5 gm., distilled water 100 cc.; the fluid becomes a pale yellow, and in this they are left for 12-24 hours. These times can often be reduced so that the final sections can be made in 24 hours if the original piece of tissue taken was very thin, 1 mm. Should a contrast stain be desired the Giemsa method may be employed as well. It is claimed that the results are good and constant, the process simple, and the risks of too little differentiation or excessive decolorization less than with aniline dyes.

H. Harold Scott.

KINGSBURY (A. Neave) & KANAGARAYER (K.). **On the Technique and Significance of the Rosindole Reaction, applied to Urine.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 161–163. With 1 chart in text. [3 refs.]

The authors have applied the rosindole test to urine (see this *Bulletin*, Vol. 19, pp. 81–82) employing a slight modification of GORE's cotton-wool plug method. The mouth of the test-tube is closed by a diaphragm of filter paper held in position by an indiarubber band. On this paper is placed 3 drops of the persulphate solution, followed by 3 drops of the p. dimethyl-amino-benzaldehyde solution. The contents of the tubes are kept heated by immersion in boiling water for 7 minutes. The rose colour which develops on the filter paper tends to fade when the tubes are no longer heated, so readings should be made at once.

By dipping filter papers in weak solutions of neutral red it is possible to approximate the rose colour, and by matching the colours against those obtained with known indol solutions, a quantitative test can be made.

Applying this test the authors find that a positive result does not indicate the presence of indican in urine, thus contradicting GORE's suggestion. [See this *Bulletin*, Vol. 22, p. 310.] The urine of a number of patients was examined both by the Obermeyer test and the rosindole reaction (referred to as R.I.), and it was found that the percentage of positive cases decreased in nephritic cases and increased in liver insufficiency cases.

E. H.

HARVEY (W. F.). **Bacteriological and Laboratory Technique. Section XI. Pathogenic Material Examination.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 503–535.

This section, numbered P4, P5, and P6, deals with the examination of material for organisms, without reference to pathogenic qualities. The classification adopted follows that of the Manual of Determinative Bacteriology issued by the Committee of the American Society of Bacteriologists.

E. H.

BOCK (Joseph C.) & GILBERT (Max). **A Drying Apparatus for Laboratory Vessels.**—*Jl. Lab. & Clin. Med.* 1925. Apr. Vol. 10. No. 7. pp. 579–581. With 1 text fig.

A stream of compressed air is passed through a coil heated by a flame. The heated air escapes through one or several perforated tubes over which the vessels to be dried are suspended.

E. H.

ASHESHOV (Igor-N.). **Préparation des membranes en collodion graduées.**—*C.R. Soc. Biol.* 1925. Feb. 13. Vol. 92. No. 5. pp. 362–363.

A method of producing membranes of different porosities, by adding small quantities of amyl alcohol to diminish the permeability. Those interested should consult the original article.

E. H.

LEAGUE OF NATIONS. Health Organisation. Reports on Serological Investigations presented to the 2nd Internat. Conference on the Standardisation of Sera & Serological Tests held at the Pasteur Institute in Paris in November, 1922.—V—Serodiagnosis of Syphilis. pp. 169–300.

LEAGUE OF NATIONS. Health Organisation. Investigations on the Serodiagnosis of Syphilis. Report of the Technical Laboratory Conference. (Held at Copenhagen, November 19th to December 3rd, 1923.) (With two annexes.) 183 pp.

LABORATORY REPORTS.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1924. Nov. 20 & Dec. 11. Vol. 18. Nos. 5 & 6. pp. 237–248. With 8 figs.—**Laboratory Meeting.**

Most of the exhibits have been elsewhere described, and these will not be referred to here. Dr. H. B. DAY demonstrated charts and photographs of cases of Egyptian Splenomegaly and sections illustrating its pathology. The disease is said to be the result of bilharzial infection, and slides were shown illustrating the irregular cellular infiltrations in the liver produced by deposited ova of *Schistosoma mansoni*, and also the dense fibrosis that may result. Captain DYE showed photographs of cases of splenomegaly due to schistosomiasis in Nyasaland. The intermediate host of *Sch. mansoni* in this region is a species of *Planorbis* allied to *P. sudanicus* Martens, and photographs were shown illustrating the pools in which it is found, and which are used as latrines by the children.

Dr. Jaroslav DRBOHLAV gave a demonstration of a method for the cultivation of *Entamoeba histolytica* worked out by himself and Dr. W. C. BOECK :—

The culture media employed were slants of coagulated egg (Dorset) or blood-agar, covered with Ringer's or Locke's solution containing human serum diluted 1 in 8, or a white of an egg to one litre of Ringer's or Locke's solution. The latter fluid is preferable, as it is slightly bactericidal. For inoculation it is necessary to take a small piece of blood-stained mucus from a fresh warm stool and inoculate into a warm medium, and at once place the tube in the incubator at 37° C. It is necessary to make transfers every two to four days.

The tenth sub-culture of a strain of Entamoeba obtained from a case of amoebic dysentery in England was shown at the meeting.

Dr. HANSCHELL showed photographs, reproduced in the *Transactions*, of a case of gonorrheal Keratodermia blenorrhagica in a native of India. The patient, a lascar, suffered from gonococcal urethritis, prostatitis and vesisitis, with synovitis and periarthritis of right knee and wrist, and showed on the external surface of both arms many small horny excrescences. Subsequently, these grew larger, up to 1 inch in diameter, and spread all over the body and scalp; also, marked hyperkeratosis of the palms and soles developed. During six months there was no improvement until during the last month, when gonococcal vaccine was given intravenously, and thyroid by mouth. The patient at once showed very marked improvement, all the symptoms gradually subsiding.

Colonel S. P. JAMES showed specimens of *Anopheles maculipennis* from Sheerness, fed on a case of benign tertian malaria in England. Malarial zygotes developed in a small number of this batch, but cysts containing " black spores " were present in the majority. Encysted trematodes attached to the alimentary canal are frequently found during dissection of Anopheles in England, as well as abroad, and one of these was demonstrated. Col. JAMES also showed specimens of larvae mounted more than two years ago by the following method :—

Using melted dental wax and a ringing machine, make a cell of the requisite depth on a glass slide. By means of a pipette transfer a larva from the formalin solution (4 per cent.) to the cell and, if necessary, add more formalin to fill the cell. Arrange the larva in a good position and cover the cell with a cover-glass. Fasten the cover glass with a ring of " Murrayite,"* and when dry add more layers with the ringing machine until the cell is hermetically sealed.

A method of showing the pigment and morphology of malaria parasites and Schuffner's dots was also described :—

Make the blood films or drops of only moderate thickness and allow them to dry in air protected from flies and dust. When dry, simply place them on their edges in a grooved porcelain staining trough, and fill the trough with Giemsa stain diluted 1 in 30. Stain for 24 hours, wash for a few seconds in a 10 per cent. solution of sodium hyposulphite, then wash in tap water and afterwards in distilled water and allow to dry.

Dr. P. H. MANSON-BAHR showed a painting and photographs of kala azar pigmentation of the feet in a young European woman, who had been suffering from this disease for eighteen months. The dusky brown pigmentation was not only present on the feet and ankles, but also on the hands and elbows, and the lower abdomen. This case was resistant to antimony treatment, but at once began to improve when injections of 0·3 gm. neosalvarsan per week were administered.

Lt.-Col. H. MARRIAN PERRY exhibited a case of Xeroderma pigmentosum in which the variability of the skin lesions was well shown, ranging from freckles and diffuse pigmentation to raised irregular nodules. Sections of the latter showed marked epithelial infiltration, and illustrate the early carcinomatous changes which occur in some of these cases.

Professor STEPHENS showed specimens of blood from a case of sleeping sickness in which the auto-agglutination of the red blood corpuscles was very apparent. Dr. J. Graham WILLMORE showed a tumour of the suprarenal associated with intense fatty degeneration of the liver and obliteration of the endothelial system. Clinically, the stools resembled those of sprue cases, while bile was absent from the faeces, blood and urine.

E. H.

TANGANYIKA TERRITORY. **Report of the Dar-es-Salaam Laboratory, for the Year 1923.** [BUTLER (G. G.), Director.]—*Ann. Med. Rep. for the Year ending December 31st, 1923, Tanganyika Territory.* pp. 184–202. With 1 chart.

Tables are given illustrating the general routine examinations. 2·2 per cent. of the blood films of all nationalities contained microfilaria, but the variety has not yet been determined. There is a sharp rise in the findings during April, when the rainfall is at its height, but all these figures refer only to the day blood of patients.

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* A spirit proof cement sold by Messrs. Flatters and Garnett, Ltd., 309, Oxford Road, Manchester.

The blood films of a number of wild animals were examined and malaria-like parasites observed in a Cercopithecus and a baboon; trypanosomes were seen in Nycteris bats, and microfilariae in a fox, roan, and Agama respectively.

Under the examination of faeces it is interesting to note that the dysentery-like stool of a young female gorilla was found to contain numerous Entamoebae resembling *E. histolytica*, and eventually the animal succumbed to the infection in spite of emetine treatment.

A chart is given showing the malaria curves for European, Asiatics and Natives, respectively, and in association with these curves the author has plotted the rainfall, mean temperature and humidity and the Anopheline larvae finds. The curve of the latter is identical with the native malaria curve, but the mean humidity and temperature show no relation to the malaria curves. However, humidity is considered to be a main factor in the incidence of malaria and experiments are in progress to test this view.

For the transport of lymph the procedure is to pack in crushed ice and sawdust in special carrier boxes as advertized by GALLENKAMPF. Experiments showed, however, that at 24°-26° C. the contents of these boxes reached room temperature in about 18 hours, and therefore such packing is of little use if the destination is more than 24-36 hours away. During the year the number of cases of smallpox notified has fallen from 390 in 1922 to 210 in 1923, and this drop has been continued during 1924.

A number of experiments were made to compare the Kahn and Wassermann tests in syphilis and yaws and the following results obtained:—

"1. Judged on clinical grounds:—

"The Kahn and Wassermann tests give approximately parallel results in Syphilis, but the former appears to be rather more sensitive in Yaws cases.

"2. Judged on serological results, there is agreement between the Wassermann and Kahn tests in 81·2 per cent. of the sera sent for examination.

"3. Bismuth Sodium Potassium Tartrate affects the Wassermann and Kahn tests similarly, but the former test is more easily influenced than the latter and appears to run *pari passu* with the clinical symptoms: the Wassermann test appears to be of less value than the Kahn test in judging the progress of a case."

E. H.

UGANDA. **Annual Report on the Bacteriological Department for the Year ended 31st December, 1924.** [DUKE (H. Lyndhurst), Bacteriologist.]—11 pp. 1925. Entebbe: Govt. Printer.

The most important part of the report is concerned with trypanosomiasis investigations, and has been noticed elsewhere [*ante*, p. 529]. A severe outbreak of dysentery occurred at Kampala during the year, and for the first time *B. dysenteriae* (Shiga) has been isolated from Buganda natives, all previous cases that have been examined being referable to the Flexner bacillus.

Ankylostome eggs were found in 91·1 per cent. of native stools examined, and probably the infection rate is higher, but the writer states that it remains to be proved whether, under normal living conditions, a few worms do the human host any harm. *Schistosoma mansoni* was also found to be a fairly common parasite.

E. H.

NIGERIA. **Annual Report on the Medical Research Institute for the Year 1923.** [CONNAL (A.), Director.]—*Ann. Med. & San. Rep. for the Year 1923, Nigeria.* Appendix I. pp. 1–29.

Blackwater Fever. Four cases were examined for spirochaetes by triple centrifugation of the blood, with negative results. Details are given of 12 cases in Europeans, 2 of which were fatal.

Relapsing Fever. A small outbreak occurred in Lagos during 1923, the only previous authentic record of its occurrence being in 1910. Guineapigs and monkeys were inoculated with citrated blood containing spirochaetes from one of the cases, and all the monkeys (4) became infected, but showed no relapses. The guineapigs never showed any signs of infection.

Leprosy. During past years various methods of treatment have been employed, but in 1923 it was decided to resort again to intravenous injections of Moogrol. Seven patients treated in this way all showed improvement, and similar results are reported by medical officers who had used Moogrol in out-stations.

Calabar Swellings. Ten more cases in Europeans have been obtained, in all of which the infection was contracted in Nigeria or in British Cameroons. The lapse of time between first exposure to infection and the first appearance of signs of the disease is given as one year or less in five instances; the shortest period is 3 months, the next 4 months and then 7 months, 9 months and 1 year; the other periods are 2, 3, 6, 7, and 10 years, respectively. Swellings occurred in 9 cases, and were absent in one. The worm appeared in the eye in 6 cases. The outline of the worm has been seen beneath the skin in 4 cases. Embryos of *Filaria loa* were observed in the blood in 3 cases, out of 7 examined. The swellings occurred in the upper limbs in all the patients; in early cases they persisted longer and the period of freedom was shorter than in older infections. In three instances the swellings had been absent for long periods. One case that received a course of intravenous injections of Stibenyl has shown no signs of infection since treatment, 18 months previously.

Filarial Embryos from the Skin. The skin of 55 natives was examined in Lagos, and embryos were found in 6. In 2 of these the embryos of *Agamofilaria streptocerca* were observed, in addition to *Onchocerca volvulus.* The cases were chosen at random and in no instance was there any appearance of lichenification, or other abnormality of the skin.

Experiments were made on the transmission of *Acanthocheilonema perstans*, a number of *Mansonioides africana* being fed on patients infested only with *perstans*; of 14 mosquitoes that fed, 1 showed a slightly larger larva in the thorax, and 3 unchanged larvae in the same region. No other developmental forms were observed. Sixty-two house flies were dissected, and in one specimen of *Musca domestica* the author reports that "numerous *Strongyloides* ova and larvae were seen." No amoebic cysts were found, but Herpetomonas occurred in the gut of 16 flies.

Entomology. A systematic examination was made of the mosquitoes collected by labourers from the vicinity of native houses. *Mansonioides africana* greatly outnumbered all other species; 4,027 were collected, of which 3,064 were dissected. Larvae of filaria were found in the proboscis of one, and in the muscles of the head and thorax of another. Small nematodes occurred in the stomach of two, and in a third much larger nematodes were present. Spirochaetes occurred in the stomach of five, and various amoebae and other Protozoa were occasionally observed.

E. H.

SERGENT (Edmond). **Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1923.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Sept. Vol. 2. No. 3. pp. 423–438. With 4 plates.

During 1923, the heavy spring rains were followed by a serious outbreak of malaria and localities which had been exempt became infected; by means of quininization, mechanical protection, and destroying the mosquito larvae, 53 villages were protected. Reduction of cases of malaria accompanied by diminution in the spleen rate is well shown in two villages, where prophylactic measures have been continued for 15 years.

Photographs of four propaganda panels deal respectively with the prophylaxis of malaria, relapsing fever, camel trypanosomiasis (El Debab), and oriental sore, and comprise graphic representations of the causative organisms, the intermediate hosts and methods of infection, and, finally, how to avoid infection.

E. H.

MAURITIUS. **Report of the Government Bacteriological Laboratory for the Half Year ended 30 Sept., 1924.** [BARBEAU (L. G.), Supt. & Govt. Analyst.] [M.S. Report received from the Colonial Office.]

Mainly a record of the routine examinations of the laboratory. An antigen prepared from ox heart was employed concurrently with the usual antigen from human heart for the Wassermann reaction, and the results were concordant.

E. H.

MADRAS. **Report on the Working of the King Institute of Preventive Medicine, Guindy, for the Year 1923-24 (with Appendices).** [CUNNINGHAM (J.), Director, King Inst., Guindy.] pp. 29+2. With 3 charts. 1925. Madras: Supt. Govt. Press. [Price, 12 annas.]

During the year the Madras Government has issued an order sanctioning the general issue of glycerine lymph instead of lanoline lymph; supplies are now issued four times a month to vaccinators and must be used up within four days of receipt. During the hot weather vaccination was discontinued for four months in all districts. 2,184,590 cases of lymph were despatched during the year, the largest issue on record since the Institute was founded; moreover, the results show a distinct improvement on previous years as regards success rates. A chart is given showing the monthly case and insertion success rates for glycerine lymph, both for primary and re-vaccination. A second chart shows these results grouped according to districts, with different types of monsoon prevalent. The success rates vary between 91·1 and 95·4 per cent. The average yield of pulp per calf has now risen to 23·5 gms., as opposed to 20·4 gms. last year.

A second investigation unit has now been authorized, and both units were engaged in the field for the greater part of the year. They were utilized to investigate an outbreak of cholera; an epidemic of relapsing fever in the Nilgiris; an outbreak of gastro-enteritis in the Alipuram Jail, Bellary; and to make a malarial survey of the Sappal Hills at Olavakot. The reports on cholera and gastro-enteritis, respectively, are contained in two appendices.

It is noteworthy that the success of the Institute from a financial point of view has been conclusively demonstrated, and the Government now recognizes that the Institute not only pays its way, but, in addition, brings in a handsome profit.

E. H.

NEW SOUTH WALES. **Fourteenth Report of the Microbiological Laboratory (Government Bureau of Microbiology) for the Year 1923.** [FERGUSON (E. W.), Principal Microbiologist.]—*Rep. Director-General of Public Health, New South Wales, for the Year 1923.* pp. 132–133.

Section IV of this Report is concerned with the work of the Microbiological Laboratory. During 1923 only one case of plague occurred in N.S.W.; no infected animals were found, although 19,176 rats were examined, the fleas found on them being *Xenopsylla cheopis* (895); *Ctenopsylla musculi* (672); *Ceratophyllus fasciatus* (376); and *Ctenocephalus felis* (11). An interesting chart is reproduced showing the seasonal prevalence of the first three species of fleas on rats examined in the laboratory each year from 1909 to 1923, inclusive, from which it is evident that *Xenopsylla cheopis*, in most years, shows an enormous increase in numbers about the month of February. The Schick reaction was tried in various country schools and on an average about 27 per cent. gave a positive reaction. Boys were found to have a much higher degree of immunity than girls, about twice as many girls showing a positive reaction. As far as possible an attempt was made to immunize all susceptible children by the inoculation of toxin-antitoxin mixture, and by the extension of these operations it is hoped to eradicate diphtheria from the Colony. The report concludes with a useful summary of the present state of our knowledge of Australian ticks, including all described species.

E. H.

TROPICAL DERMATOLOGY.

CASTELLANI (Aldo). **Observations on Some Diseases of Central America.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 1. Vol. 28. No. 1. pp. 1–14. With 29 figs. and 1 coloured plate. [21 refs.]

This account refers to some thirteen skin conditions. Under the designation Guatemala nodules is described a nodular affection of the scalp associated with eye symptoms (conjunctivitis and keratitis) and erysipelas of the face, scalp and ears. The nodules, varying in size from that of a pea to a large nut, occur on the scalp, and less frequently on the body, mainly on the sides of the chest and close to the ribs. Deeply embedded in the subcutaneous tissue the nodules give the impression of being attached to the bone and may, indeed, develop under the periosteum. Within such lesions are found adult filariae and numerous microfilariae, which latter may be found also in the subepidermal tissue in other regions of the body far from the scalp, but only rarely in the blood. This filaria has been nominated *Onchocerca caecutiens* and is morphologically similar to *O. volvulus.* Treatment consists in surgical excision of the nodules. The affection is supposed to be transmitted by a species of simulium or by a culex mosquito. The geographical distribution appears to be extremely limited.

It is noted that rhinoscleroma, a rare disease of tropical countries, is a comparatively common affection in Guatemala. Three types of leishmaniasis are described: (*a*) espundia; (*b*) framboesiform (including infection of the ear); (*c*) Delhi boil. Two cases of mycotic stomatitis, observed in Honduras, showed patches of a thin translucid whitish film on parts of the oral and lingual mucosae, suggesting the early stages of leucoplakia. Cultures showed a yeast-like fungus and bacillus in apparent symbiosis. Dermatitis papulosa nigra occurs on the malar region of the face and on the forehead as non-pruriginous black or very dark brown papules, which may be cupoliform or flattened. First appearing in youth, these lesions increase in number and size as age advances; their etiology is unknown; they differ from ordinary and senile warts. The red mite of Panama and Honduras, giving rise to an extremely pruriginous papular eruption, is identified as *Trombicula tlalzahuatl.*

Four cases of Pinta are reported and discussed. Concerning such cases as seen in Honduras the conclusion is drawn that: (1) Yellow pinta covers two conditions, (*a*) due to the fungus of tinea flava, (*b*) of trophic origin associated sometimes with the occurrence of a saprophytic yeast-like organism; (2) black pinta includes cases of (*a*) the various chloasmata which may be associated with different saprophytic moulds and observed all over the tropics, (*b*) altered pigmentation following trichophytic infections, (*c*) tinea nigra occasioned by *Cladosporium mansoni*; (3) White pinta includes (*a*) leucoderma and (*b*) depigmentation associated with chronic mycotic infections.

Among the other conditions mentioned are myiasis, granuloma inguinale, pineapple estates pyosis, mossy foot and alastrim.

W. Jenkins Oliver.

CASTELLANI (Aldo). **Tropical Dermatology.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 485–498. With 2 figs. [United Fruit Company, Boston, Mass.]

A short account of some less-known tropical dermatoses, of varying etiology, personally investigated and reported in the literature by the writer. This contribution does not lend itself to further summarizing.

W. J. O.

KÄYSER (J. D.). **Cosmopolitische huidaandoeningen in de tropen.** [Cosmopolitan Dermatoses in the Tropics.]—*Herinneringsbundel Inst. v. Trop. Geneesk, Leiden.* 1924. pp. 92–103. With 11 figs. on 6 plates.

A discussion on the occurrence in the tropics, especially in Java, of more or less ubiquitous skin diseases, which, in the tropics, may show such aberrant characters as to be taken for quite distinct diseases, especially if the European variety of the disease is comparatively rare. The skin affections discussed here are : Ulcus phagedenicum, corresponding to the former hospital gangrene ; the granuloma venereum, which is, perhaps, identical with the ulcus molle serpiginosum ; a skin disease known as " Panu " among the Javanese, but probably identical with pityriasis versicolor ; eczema marginatum, which among the Javanese is by no means restricted to the inguinal region ; a skin disease much resembling Hebra's prurigo, but differing from it by its spontaneous recovery by the time the patient reaches the period of puberty ; psoriasis, which occurs in Java (as it does in Ceylon, according to CASTELLANI, contrary to many other authors who have not observed this disease in the tropics), but less frequently than in Europe and usually (though by no means always) in a milder form ; scabies, of frequent occurrence (25 per cent. of all skin diseases), but difficult to diagnose during the complication of pyodermia, rendering difficult the demonstration of the acari.

N. H. Swellengrebel.

URUETA (Eduardo). **" Pinta " or " Carate." (With Special Reference to Treatment.)**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 524–531. [United Fruit Company, Boston, Mass.]

Pinta is defined as a group of tropical dermatomycoses caused by various species of fungi which live and grow in the superficial layers of the skin. The geographical distribution of the disease in tropical America is cited. The list of causative fungi includes members of the genera *Aspergillus, Penicillium, Monilia* and *Montoyella,* which fungi affect mainly the horny layers of the epidermis, while there may be changes in the prickle-celled layer and in the corium. " In later stages pigment cells are more or less destroyed." Fungous elements were more rarely found in the scales of the dull white than of the darker varieties of the affection. The climatic conditions and the slovenly habits of the natives are considered to be the main predisposing causes of infection. Commencing usually on the forehead the lesions may spread to involve the whole body, the uncovered areas being the first affected. " The chromatic scale of the varieties goes from the yellowish-violet, blue, and black, which are the more frequent, to the red less frequently seen in Colombia, until it reaches the dull white which is the last stage of the disease." The red variety, produced by *Montoyella bodini*, is quoted as being the most pruriginous type. Treatment by local application of the varnish is recommended: Chrysarobin 5 gm., gutta-percha 5 gm., chloroform 80 cc. The leucodermic patches may be tattooed.

W. J. O.

PAES (Santana). **Nouvelle contribution à l'étude des dermatomycoses d'Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a 7a e 8a Sessões.) 1923. Aug. No. 4. pp. 499–504. With 2 plates.

Three cases of dermatomycosis are reported from Loanda, from all of which the fungus was observed and cultured. Case I, Hebra's eczema marginatum showed *Epidermophyton cruris* (Castellani); Case II, Tinea tonsurans, *Microsporon audouini* [description suggests rather a microsporon of animal origin]; Case III, favus of scalp of nine years' duration gave *Achorion gypseum* (Bodin).

W. J. O.

WOLFE (W. B.). **Epidermophytosis.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 562–573. With 5 figs. on 3 plates. [23 refs.]

Following a brief historical survey of the subject a general account of the disease is given as it affects particularly the interdigital clefts, hands, feet and genitocrural folds. Any local condition of hyperidrosis or of warm moisture favours the growth of the fungus. Stress is laid upon the macerated appearance of the skin in particularly the fourth interdigital space of the feet with the marked often painful fissure at the base of the fifth toe, also upon the sago-grain deep-seated vesicles on the hyperkeratotic areas noticeable especially in stokers, etc., working among hot boiler plates. As many as nearly 50 per cent. of the marines from one ship examined for other complaints on their return from Santo Domingo were found to be infected in either the genitocrural or volar regions. General therapeutic measures consist in thorough disinfection of the clothing and the avoidance of wearing thick warm socks, etc. For local treatment the regular bathing with potassium permanganate solution (10 per cent.) and the application of Whitfield's ointment is recommended. The hyperkeratotic epidermis should first be dissolved by potash and all deep-seated vesicles opened.

W. J. O.

DE MELLO (Froilano) & PAES (Santana). **Sur un tricophyton à culture faviforme agent d'une teigne du cuir chevelu.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a. 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 505–513.

A general schematic classification of the trichophyton fungi is presented. A case of tinea tonsurans, concerning a negro child, is reported, which showed the presence of a trichophyton of the endoectothrix type. The cultural and mycological features are described, and the fungus identified as *T. faviforme* type *angolense*.

W. J. O.

OROL-ARIAS (C.). **La "Pedra" ou pierre de l'Argentine.**—*Jl. Méd. de Bordeaux.* 1925. Jan. 10. Vol. 102. No. 1. pp. 7–12. With 14 figs.

Interesting report, concerning a man aged 22 years, in whom the hair of the scalp in places presented small black hard nodular concretions, as many as 16 being counted over a length of 5 cm. on one hair. Most numerously distributed towards the free end of the hair and never less than 1 cm. distant from its root, the nodules, 0·5-1·5 mm. in diameter and 2 mm. length, either encircled the hair or were laterally disposed. There was no apparent alteration in tractability or friability of the affected hairs. Microscopical examination showed the concretions to consist of a conglomeration of rounded spores, each surrounded by a resistant membrane of double contour with protoplasm containing a nucleus and nucleolus. The cultural and microscopical appearances are described in detail, and the fungus recognized as of the order *Ascomycetes*, species *saccharomyces*. Treatment of the condition, which is readily cured, consists in frequent washings of the scalp and the application of 1-2 per cent. sublimate solution.

W. J. O.

MITCHELL (J. A.) & ROBERTSON (G. W.). **"Witkop" or "Dikwakwadi" in Bechuanaland Natives. Report of Investigation.**—*Med. Jl. S. Africa.* 1924. Dec. Vol. 20. No. 5. pp. 122–125. With 4 figs.

This article originally appeared in the *South African Medical Record* of Feb. 15, 1915, and is now reprinted in view of the assertions made by Drs. D. C. MACARTHUR and E. N. THORNTON that "witkop" is a manifestation of hereditary syphilis, published in two papers on syphilis among natives of Bechuanaland, which were reviewed in this *Bulletin* in 1924 (Vol. 21, p. 399). The reviewer therein pointed out the very doubtful evidence adduced in favour of this hypothesis, and the present writers' investigations go to prove that "witkop" is definitely the result of an infection with the fungus of favus; whether an already existing syphilitic infection plays any part as a predisposing cause remains uncertain.

The investigations were carried out upon four typical cases of "witkop" which were taken from the Taungs district of Bechuanaland to the Somerset Hospital, Capetown. A clinical description of the disease is given, together with microscopic and cultural findings. Three of the four cases gave positive Wassermann reactions, the fourth was negative, but none showed any clinical manifestation of syphilis. Treatment by internal administration had no effect on the scalp condition, and full doses of salvarsan were equally without result, but all cases, even the worst, cleared up in 2 or 3 weeks under local treatment with dilute nitrate of mercury ointment. To prevent relapse it was found necessary to prolong the treatment for 2-3 months.

H. S. Stannus.

BAERTS (F.). *Discomyces congolensis.*—**Agent étiologique d'une actinomycose nouvelle occasionnant des lésions attribuées jusqu'à présent à la syphilis, au pian ou au phagédenisme.**—*Bull. Méd. du Katanga.* 1925. Apr. Vol. 2. No. 2. pp. 67–75.

The affection may occur on any part of the body, save the scalp, palms and soles, commencing as a small subcutaneous or submucous nodule which becomes adherent to the skin. The lesion then softens and on aspiration yields a clear viscous fluid, occasionally purulent, in which the mycelial filaments may be demonstrated. Left alone such lesions will rupture spontaneously to form characteristic ulcers with irregular borders. Secondary contamination with staphylococci, streptococci and fusospirillary organisms may follow and the suppuration involve tendons, muscles, joints and even bones. Men become impotent, women sterile, and children crippled. Such advanced cases present the mutilated appearances described by VAN NITSEN, destruction about the nasopharynx leading to the condition of "gangosa," while another characteristic lesion is that of polydactylitis. The pus shows actinomyces granules, gelatinous, semi-transparent, in colour whitish, yellowish or greyish, more or less globular-shaped in the smaller forms and oval when reaching 3-5 mm. diameter, containing colonies of mycelium. The microscopical appearances of the mycelium and clubs are described in detail. For staining purposes gentian violet and Pappenheim's stain are recommended. The cultural characteristics have not been determined. While the fungus is specific in being found in all the fluctuating lesions of the affection described, it may also occur as a complicating factor in the lesions of syphilis, yaws and tropical sore: it has not been demonstrated in the closed bony lesions. No specific treatment has been found; the improvement observed under and only during the course of neosalvarsan administration may be due to the beneficial effect of the drug on the general condition as occurs under any form of arsenic treatment. Locally antiseptic applications, especially iodoform, should be employed wherever possible. An interesting table is given to show the various native names for the disease in the different areas of Belgian Congo.*

W. J. O.

LOVEJOY (Edward D.) & HAMMACK (R. W.). **Mycetoma. Report of Four Cases.**—*Arch. Dermat. & Syph.* 1925. Jan. Vol. 11. No. 1. pp. 71–79. With 4 figs. [10 refs.]

Four cases, all occurring in Mexicans, are reported from Los Angeles. Two of the patients gave a history of having worked barefooted about the time of onset of the affection, while the remaining two described traumatic occurrences. The actinomycotic fungi were not identified except in the second case reported, from whose lesions a streptothrix was obtained in culture for which the name *Actinomyces mexicana* is suggested. "While mycetoma has been found in various parts of the United States, it is more common in the south west."

W. J. O.

ANDERSON (Ch.). **Sur quatre nouvelles observations tunisiennes de mycétome.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 90–92. [4 refs.]

Four new cases are reported, one due to *Scedosporium apiospermum*, the cultural characteristics of which are described, the remaining three cases to *Discomyces*. This report brings the number of observations reported to date from Tunis to a total of 16.

W. J. O.

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* Reference is made to VAN NITSEN's paper on the tertiary manifestations of yaws [this *Bulletin*, Vol. 18, p. 251]. Many of the symptoms there described Baerts would attribute to the Discomyces.

PUTZU (F.). **[Mycetoma of the Foot in Europe.]**—*Arch. Ital. di Chir.* 1924. Nov. p. 585. [Summarized in *Brit. Med. Jl.* 1925. Mar. 28. (Epitome of Current Medical Literature.) p. 58.]

Case report, the first from Sardinia, of a boy aged 16 in whom the disease had commenced at the age of 9 years without any apparent cause on the sole of the foot to increase rapidly in extent during the last two years as the result of an injury. Cultures of the blood-stained pus with yellowish granules, from the numerous pustules on the swollen foot, showed an organism identical morphologically and experimentally with actinomyces. Amputation of the foot was performed.

W. J. O.

DA FONSECA (O.). **Sur l'étiologie du** *chimbéré,* **nouveau type de dermatose endémique des Indiens du fleuve S. Miguel.** *Endodermophyton roquettei,* **n.sp.**—*C.R. Soc. Biol.* 1925. Feb. 6. Vol. 92. No. 4. pp. 305–306.

Brief report of a case of dermatomycosis in an Indian showing confluent circinate scaly patches on the face, neck and anterior part of the thorax. All the lesions were remarkably achromic, with the scales readily detached. Microscopical examination revealed a segmented mycelium in the scales. Cultures were obtained and the fungus recognized as an endodermophyton to which the name *E. roquettei* was given. Somewhat resembling tinea imbricata the lesions showed nothing of the concentric pattern characteristic of that affection. The patient stated that some 50 persons of his tribe were suffering from this apparently endemic infection known among themselves as *chimbéré.*

W. J. O.

DA FONSECA (O.). **Sobre a etiologia do "chimberê," dermatose endemica dos indios do rio São Miguel.**—*Sciencia Medica.* 1924. Nov. 30. Vol. 2. No. 11. pp. 615–617. With 2 plates.

The cutaneous condition here described attacks a considerable number of the Indians of the district. The lesions consist of large confluent circinate patches, scaly and itching. The exfoliated segments vary in size from less than a millimetre to half a centimetre. In the patient whose case is described the front of the scalp, the face, throat and anterior part of the thorax were involved. Microscopically, there is seen to be a mycelium with pigmented granulations, varying in colour from a dark chestnut to a light yellow. The condition most nearly resembling it is " tokelau " of Asia, or Tinea imbricata, but it does not present the concentric disposition of the latter. It is quite different from Pinta. Further study is to be undertaken to determine more accurately the nature of the fungus.

H. Harold Scott.

ADCOCK (E. W.). **A Case of Cutaneous Blastomycosis.**—*Nigeria Ann. Med. & San. Rep. for the Year 1923.* Appendix IV. p. 36.

Case report concerning an European official with an eczematous eruption, of two years' duration, on the left palm and interdigital clefts, showing small deep epidermal blisters in the fluid of which were observed small yeast-like cells. Local treatment was unsuccessful, while improvement was obtained with intravenous injections of tartar emetic.

W. J. O.

JAMES (J. F.). **A Note on the Treatment of Tropical Ulcer.**—*Indian Med. Gaz.* 1925. June. Vol. 60. No. 6. p. 274.

Brief note in support of the success obtained through the employment of moist compresses of 25 per cent. solution magnesium sulphate applied locally to the sores until healing was complete. Hot permanganate baths may be usefully added in very foul sloughing cases.

W. J. O.

KERVRANN. **Traitement de l'ulcère tropical par l'émétique.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol 23. No. 1. pp. 128–130.

Treatment by the intravenous injection of 1 per cent. tartar emetic solution, commencing with 3 cc., and increasing to 5 cc., is recommended. The notes of 13 cases are briefly recorded with healing obtained after the administration of 22-27 centigrammes emetic over periods varying from 16 to 33 days. Mention is made of the beneficial action of 3 per cent. methylene blue applied locally to the lesions.

W. J. O.

REBÊLO (Frederico) & D'ALMEIDA (Carlos). **Essais de traitement des ulcères fuso-spirillaires de l'Angola.**—*Revista Méd. de Angola.* (No. especial 1^{e} Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a., 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 57–66.

This paper consists of very brief abstracts of cases of fuso-spirillar ulcers treated in various ways. For killing the microbes speedily the authors recommend, as the result of their observations: (*a*) intravenous injections of neosalvarsan; (*b*) local applications of trepol; and (*c*) lavage with Dakin's solution followed by local applications of 0·2 per cent. gomenol. (Local application of neosalvarsan merely aggravates the ulceration.) For maintaining a clean aseptic surface favourable to granulation, after the subjugation of the microbes, they recommend: (*a*) local applications of trepol; (*b*) injections of novarsenobenzol; and (*c*) local applications of gomenol solution.

A. Alcock.

THIERFELDER (M. U.) & THIERFELDER-THILLOT (M.). **Studien ueber das venerische Granulom. (Vorläufige Mitteilung.)**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. July. Vol. 28. No. 6. pp. 221–235. With 3 figs. [8 refs.]

This paper is based on observations made on over 1,000 cases seen between January and August while travelling through New Guinea. Bacteriological findings are dealt with, including descriptions of the specific cocco-bacillus, and its morphological and cultural characteristics, with a note as to associated organisms.

The authors, then, in dealing with the clinical manifestations of the disease, distinguish four stages: (1) Primary affection; (2) local spread; (3) extension by lymphatics to glands and internal organs, with death from intercurrent disease such as pneumonia or peritonitis from suppuration of mesenteric glands; (4) involvement of the nervous system. The belief in the spread to internal organs is based apparently upon the cultivation of the organism once from a liver abscess and once from a mastoid abscess among the 1,028 cases. More often they state that nasal and joint cartilages are attacked, producing conditions resembling lupus and arthritis deformans respectively. The statement in regard to involvement of the nervous system depends upon the fact that three cases among 1,028 were observed with an ascending flaccid paralysis terminating in death. [The evidence in favour of stages (3) and (4) must, therefore, be regarded as meagre and rather unconvincing, especially in regard to (4), as 2 out of the 3 cases had previously been under antisyphilitic treatment.] The differential diagnosis given is of little importance. The treatment adopted consisted of intravenous injections of tartar emetic, commencing with 5 cc. of 1 per cent. solution increasing in daily doses till 2 gm. were given in 50 days. The authors state that " the drug must act directly on them " (the organisms), as they are no longer seen after a few days, and mention that in spite of " complete cure " relapses were not infrequent.

H. S. Stannus.

FRASER (A. Reith). **Granuloma Inguinale: including a Series of Cases illustrating some Points in Prognosis and Treatment.**—*Brit. Jl. Dermat. & Syph.* 1925. Jan. Vol. 37. No. 1. (No. 435.) pp. 14–29. With 3 figs. [32 refs.] also in *Jl. of Urology.* 1925. Feb. Vol. 13. No. 2. pp. 227–246. [32 refs.]

Attention is drawn to the great prevalence of this condition among the coloured races in South Africa, and a comprehensive general account of the disease is given. Those cases in which the initial lesion is on the penis appear to show less extensive spread than where the affection commences on the pubis or genito-urinal folds. Special note is made of the absence of superficial secondary bacterial contamination of the lesions. The etiology has not been definitely determined. Complete spontaneous healing does not occur. Eighteen cases are briefly reported, of which 16 were treated with tartar emetic to give only 6 beneficial results, while one case, with a negative Wassermann reaction, healed completely after sulfarsenol administration.

W. J. O.

MCRAE (John Collier). **Granuloma Inguinale and Syphilis. Report of a Case exhibiting Both Infections.**—*Jl. Amer. Med. Assoc.* 1925. Feb. 14. Vol. 84. No. 7. p. 512. With 1 fig. [1 ref.]

Case report of double infection in a white man. The lesion had been noticed on the penis, about the coronal sulcus on the 8th day following coitus. Treated primarily as a chancroid lesion and later with nine arsphenamin injections there was no improvement of the local sore, which had gradually increased in size. Dark ground examination was negative, as also the blood Wassermann reaction. After five antimony and potassium tartrate injections the ulcer was healing when a macular syphilitic rash and sore throat developed with a positive Wassermann reaction. The antimony injections were discontinued and antisyphilitic medication recommenced. While the syphilitic lesions then improved, the penile sore relapsed to heal completely under further injections of antimony. The diagnosis of granuloma inguinale depended upon the non-reaction of the sore to antisyphilitic remedies and to its healing under antimony, with relapse when this specific was temporarily discontinued.

W. J. O.

JOHNS (Foster M.). **Some Observations on Granuloma inguinale and Cultural Studies of the Donovan Bodies.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 440–451. With 5 plates. [8 refs.] [United Fruit Company, Boston, Mass.]

Attention is drawn to cases in which the lesions had been situated in areas other than the usual inguinal region, including the gums and roof of the mouth. The appearance of the Donovan bodies is described and this organism is considered to be a protozoan parasite and not a simple encapsulated bacillus. The phagocytosis and intracellular multiplication of the organism in the endothelial cells constituting the walls of blood vessels is emphasized. Relapse of the disease, after apparent healing of the lesion, may depend upon an occasional infected endothelial cell, lying in the epithelium of the hypertrophied papillae, not being reached by the specific medicament. Interrupted rather than continuous treatment is recommended to prevent the cumulative action of the drug. All experimental attempts to cultivate the Donovan bodies were negative.

W. J. O.

ADAMS (Walter Booth). **Rat-Bite Dermatitis, with a Report of a Case.**—*Arch. Dermat. & Syph.* 1925. May. Vol. 11. No. 5. pp. 654–657. [3 refs.]

Case report concerning a woman with a blotchy erythematous rash on the arms, chest and face, with fewer lesions on the back and abdomen, following a rat-bite on the right hand inflicted some four weeks previously. The original bite lesion had healed to break down in about 16 days to form " a painful ulcer with elevated edges and some sclerosis." The axillary glands on the affected side alone showed enlargement. The condition entirely cleared after two injections of arsphenamin. The sclerosed ulceration is likened to the primary syphilitic chancre and the eruption to the syphilitic roseola. The Fontana-Trebaudeau stain is recommended for the identification of the *S. morsus muris*, which, however, was not isolated in this case, the first to be reported from Syria.

W. J. O.

KENNEDY (J. C.). **Acarodermatitis Urticarioides (Grain Itch) in Turkey.**—*Jl. Roy. Army Med. Corps.* 1924. July. Vol. 43. No. 1. pp. 45–47.

The dermatitis caused by certain grain-mites is here well exemplified: the history of intimate contact with straw or grain, the eruption, prevalent on the trunk, commonly vesiculous or pustulous, and, with the concurrent rise of temperature (100° to 102° F.), suggestive of some exanthematous fever, the intolerable itching and restlessness distractive of sleep. The cases here well recorded were reported as chickenpox, and were diagnosed clinically as dermatitis due to *Pediculoides ventricosus*, but the single specimen discovered was identified as a sugar-mite (*Glycyphagus* sp.); they recovered without any special antiparasite treatment.

A. Alcock.

THOMPSON (A. G. G.). **Barley Itch.** [Memoranda.]—*Brit. Med. Jl.* 1925. Jan. 10. p. 71.

Description of the irritating rash, "barley itch," "miller's itch," of which several outbreaks occurred towards the end of last year at ports in the South of England where cargoes of barley from Morocco were being unloaded. The mite causing the rash seems not to have been identified precisely.

A. A.

LAPIN (M. O.). **Ein zweiter Fall von Creeping Disease.**—*Dermat. Woch.* 1924. Dec. 27. Vol. 79. No. 52. pp. 1654–1660. With 4 figs.

A long and inconclusive account of the extensive meanderings of a "larva migrans" in the skin of a little girl in the second year of her age. The presence of the larva was first noticed on the buttock, and in the course of six months' observation it wandered, with many circuitous doublings and turnings and crossings of track, over extensive areas of the abdomen, back, and breast. Attempts to stop its advance by external applications and galvanocautery and attempts at excision were equally unsuccessful, and the observation was terminated, incomplete, by the abrupt departure of the child and its mother. The author thinks [but with no good reason] that the larva may have been a Gastrophilus.

A. A.

LAPIN (M. O.). **Zur Parasitologie der "Creeping Disease."**—*Dermat. Woch.* 1924. Vol. 78. pp. 573–584; 611-616; 638–643. With 15 text figs. [26 refs.]

This is a voluminous monograph, beginning with the first case of Creeping Disease described in 1874 by LEE. It does not add anything to our knowledge of the parasites implicated—conjectural larvae of Gastrophilus and Hypoderma—or contain anything of general interest that is not already known.

A. A.

BRODEN (A.) & BERNARD (R.). **Considérations sur les nodosités juxta-articulaires. A propos d'un cas asymétrique observé chez un Européen.**—*Bruxelles-Méd.* 1925. July 5. Vol. 5. No. 36. pp. 1144–1150. With 1 text fig. & 1 map. [7 refs.]

After referring to the definition given by JEANSELME the authors mention the name suggested by BRUMPT as more appropriate—*nodosités des saillies osseuses.* The nodes are usually symmetrical, but not invariably so; they occur on the following sites in order of frequence—trochanter, external malleolus, anterior tibial tuberosity, head of fibula, dorsal aspects of the digits, acromion, sacro-coccyx, ribs. Evolution is slow, running into years and subsequent changes—fibrous transformation, spontaneous absorption, suppuration—may take place. Common among certain tribes, the condition is rare among Europeans, the case now described, in a Belgian aged 32 who had lived in the Congo nine years, being only the tenth case found in the literature.

The history in this case was unimportant and entirely negative in respect of syphilis and yaws. The swellings appeared 4 years ago, and the patient had subsequently married and his wife borne healthy children.

There was no suspicion of syphilis or yaws, but the Wassermann reaction was strongly positive. The nodes had all presented about the left olecranon process, all had suppurated and evacuated their contents, leaving thin depigmented scars, the remaining node was typical and surrounded by an inflamed zone. A preliminary injection of 0·06 gm. sulpharsenol was followed six days later by improvement in the zone of erythema. Three more injections of 0·12 gm. then given when W.R. was still positive. Treatment with increasing doses of sulpharsenol and bismuth was then carried out between the end of October and the beginning of January, when the B-G reaction was negative and the node had practically disappeared, leaving some subcutaneous induration.

The nine other European cases referred to are: GIBLIN (1915); DE BRAULT (1916): DE GOUGEROT-BURNIER-BONNIN (1920); POUPELAIN (1920): REIMLINGER (1923): BROUARD (1923); MORIN (1924); all of whom had been in the tropics, and DE QUERVAIN (1920) and GOUGEROT (1924) cases that had not been in the tropics.

The authors point out how often among these cases in spite of a positive blood reaction there has been no history or clinical evidence of syphilis. The cases among natives tend to occur according to JEANSELME in the following groups: (1) Indo-China, Java, New Guinea and the Hawaian Islands; (2) West and Equatorial Africa; (3) North Africa; (4) Madagascar, Mauritius and the Comoro Islands; (5) Brazil—all lying between 30° N. and 30° S.

Reference is made to the belief held by various observers as to the etiology of the condition—for the authors neither syphilis nor yaws is the only cause, but they incline to the belief that either may be an etiological factor.

H. S. Stannus.

NOEL (P.). **Un cas de nodosités juxta-articulaires chez une Européenne.**—*Ann. de Dermat. et de Syph.* 1925. Mar. 6th Ser. Vol. 6. pp. 205–207. [2 refs.]

Case report concerning an European woman, aged 45, with a hard multi-lobulated tumour about the right olecranon region. A similar lesion, dating from 5 years, and previous to her arrival in India, had been excised from the left elbow. She had previously lived for some time in North Africa with a former husband. There were no definite signs or history of syphilis. After four injections badly borne of novarsenobenzol the lesion diminished very considerably. The history of her former living in North Africa is of pathogenetic interest, as the writer had not observed other cases of this condition in South India (Pondicherry).

W. J. O.

ONORATO (Raffaele). **Le nodosità juxta-articolari in Tripolitania.**—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1924. Apr.–May–June & July–Aug.–Sept. Vol. 5. Nos. 4–5–6 & 7–8–9. pp. 65–80; 97–112. [27 refs.]

The nature of juxta-articular nodules is discussed with considerable fulness. The author gives detailed descriptions of 9 cases observed by him. In 5 of these the Wassermann reaction was definitely positive; in a sixth it was doubtful the first time, but weakly positive 7 days later. Of the 3 giving a negative reaction 2 showed signs and gave a history of a former attack of yaws. The evidence, he suggests, points strongly to their syphilitic origin, and this is further supported by the fact that (though excision is the only certain treatment) antisyphilitic measures lead to a diminution, sometimes a very marked diminution, of these swellings.

H. Harold Scott.

JAMIN (H.). **Trois cas de nodosités juxta-articulaires.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 130–135. With 1 plate.

The three cases here reported concerned natives, each of whom gave a positive blood Wassermann reaction, and one showed at the same time a late circinate syphilide. A short general account of the nodules in question is appended, and it is pointed out that all observers are in agreement upon the histological features of the lesions, while five possible etiological factors have been suggested. These observations are the first to be recorded from Tunis.

W. J. O.

PINTO (Cesar). **Nodulos de Lutz.**—*Sciencia Medica.* 1924. Dec. 31. Vol. 2. No. 12. pp. 734–745. With 2 plates. [32 refs.]

Nodules of Lutz or juxta-articular nodules are defined as being symmetrical, of slow growth and painless on pressure. The author has collected brief records of 12 cases by others, and has added one of his own. Five of the patients were women and eight were men. In some of them the Wassermann reaction was definitely positive, and some showed clear signs of syphilis; treatment by mercury, by arsenic (as 914) or by Sulby's colloidal bismuth rapidly effects a cure, and the author concludes that the condition is, doubtless, syphilitic in nature.

H. Harold Scott.

FACIO (A. A.). **A Review of Ainhum, with Radiographic Demonstration of its Bone Pathology.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 533–544. With 8 figs. [United Fruit Company, Boston, Mass.]

The histological and radiographic appearances of one case are recounted and illustrated to form a short commentary on the etiology of the disease. Such features were not consistent with any trophic disorder, while the bony changes were not unlike those occurring in leprosy. Constant mechanical irritation of the bare foot, setting up a chronic inflammatory process with marked arterial sclerosis, is considered to be the main causal factor. Amputation of the affected toe should be performed as soon as the diagnosis is made.

W. J. O.

ACTON (Hugh W.). **Giant Urticaria.**—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. pp. 197–201. [9 refs.]

The condition consists in an urticaria produced under the deep fascia in contradistinction to the oedema of the superficial skin layers occurring in ordinary urticaria. Attention is drawn to the peculiar age incidence of the disease, which seems to affect chiefly young children from 15 months to 2½ years of age, and adults of 30–45 years. The intestinal flora should be investigated in cases showing general sensitiveness, as such organisms may cause a reduction of the amino acids of protein digestion to form toxic bases. Three of the writer's series of 40 cases were *Entamoeba histolytica* carriers. Dermal tests are invaluable for the recognition of the particular protein to which the patient is hypersensitive. This peculiar susceptibility of 20 cases is presented in tabular form. The differential diagnosis of the disease is compared with tenosynovitis, filarial lymphangitis and chronic erysipelas. For specific treatment is recommended sol. adrenalin hydrochloride (1 in 1,000) m2 to be given intramuscularly daily for 4-5 days, followed by suprarenalin gr. i and ext. thyroideum siccum gr. ¼ bis die on empty stomach for 3 weeks.

W. J. O.

BUTLER (C. S.), HOUGHTON (J. E.) & COOPER (G. F.). **Mycosis of the Hands and Feet.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 500–523. With 5 plates (1 coloured). [16 refs.] [United Fruit Company, Boston, Mass.]

CURJEL (Dagmar F.) & ACTON (Hugh W.). **Jute Dermatitis.**—*Jl. Assoc. Med. Women in India.* 1925. Feb. Vol. 13. No. 1. pp. 16–19.

MALARIA.

SOUTHERN MEDICAL JOURNAL. 1925. June. Vol. 18. No. 6. pp. 432–482. With 3 text figs. [17 refs.]—**Symposium on Malaria.** [FERRELL; WALCH; HEGNER; DARLING; KING; MAXCY, SMILLIE & PLECKER; LE PRINCE; WELCH; FRICKS; RANKIN; BAIR; FORT; DOWLING; UNDERWOOD; ENLOE; HAYNE; CRITTENDEN; DUGGAN; WILLIAMS; LENERT; RAWLINGS.]

Details of malaria control in 13 of the United States are described. For the rest, consideration will be limited to the papers of DARLING. The extent to which this will cover the ground debated is strikingly significant.

In "Medical Research in Malaria," undertaken at Leesburg, Georgia, the spleen rate, particularly those lesser degrees of enlargement which he deemed so important for the United States (this *Bulletin*, Vol. 22, p. 342), is shown to be a better indication of the degree of local infection than the parasite rate. The treatment of blackwater fever initiated by Dr. O. L. CRANFORD (the subcutaneous administration of 20 cc. of antistreptococcic serum) has given a very low death rate.

"Entomological Research in Malaria" emphasizes that borrowpits are not necessarily malarially dangerous, that *A. quadrimaculatus*, the malaria transmitter of the Southern States, has a culex-like attitude, and that this, as well as *A. crucians* and *A. punctipennis*, have their definite preferences for the degree of stillness, pH, and plankton content of water. Precipitin tests showed that the blood, contained in mosquitoes' stomachs, was from various animals as follows. Of 236 *A. crucians*: cow 157, pig 33, horse 30, dog 11, chicken 2, man 3. Of 272 *A. quadrimaculatus*: cow 130, man 88, pig 41, horse 7, dog 4, chicken 2. Of *A. punctipennis* none contained human blood. In screened houses 150 female mosquitoes tried to enter by the chimney in two days, all unfed virgins. Of 2,179 female anopheles dissected (*A. quadrimaculatus* 1,471, *A. crucians* 571, *A. punctipennis* 77) 60 were infected, all of the first species.

In discussion BARBER pointed out that *A. crucians* will bite man, and cannot be exonerated as a possible malaria carrier.

An important paper is that by HEGNER indicating the enormous lacunae which are known to exist in our knowledge of malaria.

Clayton Lane.

MOREAU (G.). **Epidémie de paludisme sur un navire.**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 218–221.

A mysterious epidemic attacking 16 of 24 members of the ship's crew and stopping her course at sea proved to be malaria contracted at Kaolack, Senegal, with its splenic index of 100 in children under 5. Two deaths occurring were from other causes. Of five who used mosquito nets, four escaped.

C. L.

BOECKH (R.). **Beitrag zur Epidemiologie und Klinik der Malaria tropica.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. pp. 305–316.

Writing of an epidemic at Hoijün in the province of Kwangtung, China, Boeckh concludes that malarial virulence is heightened by man's lessened resistance, and, apparently, that immunity acquired to tertian malaria does not affect subtertian infection. Regarding syphilis he notes that while he has seen no local tabes or general paralysis, he has no evidence that malaria influences syphilitic manifestations.

C. L.

RODENWALDT (Ernst) & ESSED (W. F. R.). **Investigation into the Malaria at Tandjong Priok.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 89–121. With 19 charts & 1 folding plan.

SWELLENGREBEL'S conclusion, that *A. ludlowi* is the essential local malaria transmitter, is confirmed. Its condition of breeding is plenty of decaying matter in the water, even strong pollution with urine and faeces being acceptable. Granted this, it will breed in water from that which is fresh to that having 3 per cent. of salt, the optimum in fishponds being about 1·5 per cent. The sprinkling of its breeding places every 5 days with oil residue absolutely prevented breeding, and the rapid concomitant disappearance of imagines suggested that the species is short-lived. *A. rossi* (Giles) probably plays a minor part as transmitter. The parasite rate has fallen under prophylactic measures. Nevertheless, *P. vivax* persists in many carriers throughout the year, while the subtertian parasite does not. The spleen index has not decreased, but spleens are considerably smaller. The haemoglobin index has risen.

C. L.

STEPHENS (J. W. W.). **Ceylon : Parasite and Spleen Rates. Parasite Ratios.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1925. Mar. 31. Vol. 19. No. 1. pp. 137.

Average, maximum and minimum spleen rate figures furnished by CARTER for nine Provinces were, for 56,372 children, 14, 16 and 1 ; the similar parasite rates among 4,647 children were 13, 29, and 2. The percentage parasite ratio on 1,206 children were for subtertian, tertian and quartan parasites, 11, 61, 28. The season and method of examination are unnoted.

C. L.

PALESTINE. **Proceedings of the Eleventh Meeting of the Antimalarial Advisory Commission, May 19th, 1925.** [HERON (W. G.), Director of Health, President.] [MS. received from the Dept. of Health, Jerusalem.]

Members of the Malaria Commission of the League of Nations addressed this meeting.

Professor B. NOCHT emphasized the need for propaganda and complete treatment of sick and carriers.

Professor D. OTTOLENGHI stressed the value of drainage works of medium size.

Col. S. P. JAMES noted that the temporary water storage system of Palestine struck at the root of all anti-malarial measures, and urged investigation of the number of broods of *A. bifurcatus* emerging each season. Since, in England, these numbered two only in the season, and each emerged during one or two days only, a week's oiling at the time of the third instar would perhaps free an area of the species. Similarly, one or two winter oilings for a mosquito which passed the winter as a larva would presumably suffice for the year.

Professor N. H. SWELLENGREBEL, too, referred to *A. bifurcatus*. Its habits illustrated the risks of generalization, for whereas in Holland it is wild, and never enters houses, in Palestine it is urban and domestic. In practice, "species sanitation"—the local eradication of a species judged to be primarily implicated—had given disappointing results, often from unexpected breeding habits, or, as instanced by *A. hyrcanus*, by changing from apparent harmlessness to marked infectibility.

Dr. S. T. DARLING stressed the need of thorough local pre-campaign investigation, so that work could be concentrated on real breeding places. "Species sanitation," which had proved so useful in Panama, required constant check. He emphasized the need of recognizing slight degrees of splenic enlargement (*ante*, p. 342), for where the normal organ weighed 75 grammes, the spleen just palpable on deep inspiration under the ribs weighed 90. It was only where underfeeding and hyperendemicity coincided that the largest spleens occurred.

On comment by Dr. KLIGLER, SWELLENGREBEL agreed that the constant spleen rate of Palestine as contrasted with the rapid epidemic seasonal increase in the Dutch East Indies was probably due to the preponderatingly single seasonal epidemic of subtertian malaria in the latter, and the double seasonal epidemics of tertian and subtertian in the former, remembering, too, the influence of numerous tertian relapses.

C. L.

PALESTINE. **Department of Health. Malaria Research Unit, Haifa. Annual Report, 1923.** [KLIGLER (Israel J.), Controller.]—62 pp. With 19 text figs., 9 folding maps & 5 folding charts. (Maintained by the American Joint Distribution Committee in co-operation with the Government of Palestine.)

Matters of general interest not already noted in abstracting *interim* publications are few. The average percentage decrease of malaria for all nine Demonstration Areas is 50. Drainage projects are all co-operative undertakings, part of the cost being always borne by those affected. In places, coastal marshes are being rendered malarially innocuous by conversion into evaporating basins for recovery of salt from water pumped in from the Mediterranean.

C. L.

SWELLENGREBEL (N. H.). **Een vergelijking van de statistiek der malaria-sterfte in Italië met die der sterfte aan tusschenpoozende koorts, febris intermittens en malaria in Nederland.** [A Statistical Comparison of the Malarial Deaths in Italy with Deaths from Intermittent Fever, Febris Intermittens and Malaria in Holland.]—*Nederl. Tijdschr. v. Geneesk.* 1925. July 11. 69th Year. 2nd Half. No. 2. pp. 247–257. With 11 text figs. [5 refs.]

Swellengrebel charts the general and malarial annual mortality curves for Italy, in which country the improvement observed is attributed to definite antimalarial work instituted by legislation. For Holland [where such work is recent], if, as in Italy, deaths from intermittent fever be taken in early years to represent malaria, charts show the same phenomenon. But analysis of the Dutch curves shows that for certain provinces, in years when figures for continuous fevers and diarrhoeas have increased, those for malaria have done likewise, suggesting that, particularly for diarrhoea, deaths have wrongly been attributed to malaria. The distribution through the country of malaria which the charts show, and that by age periods and sex, indicate that malaria was not, as has been suggested, introduced into Holland from the Indies, but is indigenous. Caution is urged in the attempt to explain epidemic changes in too simple terms.

C. L.

PAGNIER (A.) & SCHRUMPF-PIERRON (P.). **A Clinical Study on Malaria in the Near-East and in Europe.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 16. Vol. 28. No. 6. pp. 117–126. With 1 folding chart & 18 charts in text.

There is a "fundamental law that the onset of both vivax and falciparum attacks depend chiefly on the temperature of the air," the former appearing when the temperature drops to near 0° C., the latter when it rises to about 25° or 30° C., but continuing till it drops to 5° C. Gametes of *P. falciparum* circulate when the outside temperature is about 25° C. "The schizonts (sexual reproduction) always appear before the gametes and during the few days preceding the arrival of minimum temperatures of 25° C.," an observation which "seems a proof that production *begins in the tissues** at a temperature below 25° C., and that afterwards the gametes leave there and continue reproducing in the circulating blood." "Some authors . . . admit that it is possible, by strong treatment with quinine, to arrest malaria infection. . . . We find it difficult to understand on what idea this is based." "In patients who take adequate doses of quinine we frequently note the absence of schizonts from the blood. . . . We may further deduce that the patient dosed with quinine during his attacks is less infectious than he who does not take the medicine." Such unevidenced divergence from the evidenced, and therefore generally accepted, life-history of the malaria parasites is also reflected in the clinical types of fever which are assigned to the two parasites mentioned.

C. L.

BLACKLOCK (B.) & GORDON (R. M.). **Malaria Parasites in the Placental Blood.**—*Ann. Trop. Med. & Parasit.* 1925. Mar. 31. Vol. 19. No. 1. pp. 37–45. [7 refs.]

Plasmodium falciparum was found in 46 per cent. of 26 placentas of native women in Freetown, Sierra Leone, and in 17 per cent. of the peripheral bloods of 23 of them. Of 4 abnormal labours the placentas were infected in 3. In no case in life or after death was the child found infected. The effectiveness of the barrier normally interposed by the placenta is evidenced by the observation that the ratio of parasites in the placental to that in the maternal blood varied from 20 to 1 to 1,395 to 1. Merozoits varied from 10 to 33. Crescents were never seen in placental or peripheral blood. The former fulfils the conditions favouring culture, namely, stagnation of blood, limitation of oxygen, and presence of glucose, conditions under which crescents have never been grown. It is noted that, since the minimum known incubation period of this infection is 6 days, this period is the maximum interval between birth and detection of parasites which can be accepted as evidencing congenital malaria.

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* Italics in the original.

C. L.

ROUBAUD (E.). **Les raisons de l'absence en Europe septentrionale de l'endémie palustre estivo-automnale** (*Plasmodium praecox*).—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 279–287. [13 refs.]

The absence of subtertian malaria from Northern Europe is explained thus: SWELLENGREBEL has shown that in Holland infection with tertian malaria is probably acquired in winter. Presumably this is so also with subtertian malaria. In winter the anopheline cycle takes 50 days for *Plasmodium vivax*. For *P. falciparum* it takes longer, perhaps 3 months at 16° C., and will probably not be completed. [The need for introducing, as is done, the zoophilic factor also is not clear.]

C. L.

MÜHLENS (P.) & SFARČIĆ (A.). **Bericht ueber Malariaarbeiten in Dalmatien.**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Apr. 8. Vol. 94. No. 6. pp. 326–376. With 15 figs. on 3 plates.

In the main of local interest. The parasite index in the autumn of 1922 was 28·9, divided between subtertian, tertian, quartan and mixed infections in the percentages of 62, 14·1, 22·6 and 1·3; the corresponding figures in the period May to June being 13·9, 13·4, 52·1, 30·3 and 4·2. The splenic index during the earlier period was 53·5. Of 36 *Anopheles maculipennis* found in houses in September-October two were infected, while 18 from stables were negative. In July houses gave one infected in 72, and stables none in 50.

C. L.

DAUDY (R.). **Etude épidémiologique et prophylactique de la malaria en Albanie.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 320–327. With 2 text figs.

The Albanian capital Tirana lies in a plain, marshy in places, and intersected by a network of rivers and canals. In August-September 385 children examined showed a parasite index of 8 and a splenic index of 28. Of the 31 showing parasites *P. falciparum* was found in 25, *P. vivax* in 5, and *P. malariae* in 1. Gametes were encountered 8 times. The only adult mosquitoes captured were two *A. maculipennis,* and the only larvae those of *A. superpictus* (*palestinensis*).

C. L.

GIOSEFFI (M.). **Recrudescenza della malaria in Istria e come debellare l'infezione.**—*Policlinico.* Sez. Prat. 1925. Mar. 30. Vol. 32. No. 13. pp. 451–453.

In parts of Istria the pre-war malarial incidence was 6-9 per cent., in 1916, 26 per cent., with a recrudescence in 1924. Two-thirds of the cases were tertian, one-third subtertian. After noting various forms of recommended treatment Gioseffi advises 1·2 to 2 gms. of quinine, presumably daily, for 2 weeks, with iron, arsenic and strychnine in the intervals of quinine administration.

C. L.

ROUKHADZÉ (N.). **La parasitologie et l'épidémiologie du paludisme en Abkhasie (Géorgie).**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 327–343. With 2 charts in text.

Plasmodium vivax predominated from May to August, *P. falciparum* from August to October, *P. malariae* from November to February. Conviction that primary attacks can be recognized as such leads to the belief that all primary attacks occur during the five months beginning July, and that attacks at other times are relapses—the result of parthenogenesis of macrogametes. Malarial attacks which immediately follow many mosquito bites are attributed to protein shock. The first generation of Anopheles appears at the end of April, but hibernation, which in the complete absence of animal houses takes place in habitations, is relative, and warmed mosquitoes will feed all the year round. *A. bifurcatus* can evolve completely from egg to imago in the winter, the process taking 50 to 60 days.

C. L.

ROUKHADZÉ (N.). **Le paludisme à Oudé (Géorgie). (Etude sur le paludisme en montagne.)**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 383–388. [1 ref.]

The village is situated at 1,100 metres altitude. Of males 33, and of women 17 per cent. were infected with malaria, 40 per cent. of the infected being aged between 10 and 19 years. Examinations made in August showed two-thirds of discovered infections to be with *P. falciparum*. *P. malariae* was absent. The inhabitants work in the valley at an altitude of 50 to 100 metres. Of 50 malarial cases only 8 passed the night at this low altitude. No anopheles were detected in the village, but *A. maculipennis* existed in the valley. It is concluded that it has perforce become a day feeder here. Fever and schizonts are apt to disappear without treatment.

C. L.

HOOPS (A. L.). **Notes on Malaria Research in the Lee County S. Georgia.** [Abstract.]—*Monthly Bull. of the Eastern Bureau.* League of Nations. Health Section. 1925. Apr. 20. Year 1. No. 1. p. 23.

A. quadrimaculatus prefers neutral, but will, for breeding, use acid or alkaline waters. *A. punctipennis* uses neutral or alkaline, *A. crucians* acid, waters. Flight of mosquitoes was investigated by "spraying" with carbol fuchsin and flour (2 to 1) tree holes in which they harboured. Dipping such mosquitoes into glycerine, alcohol and chloroform (3 : 3 : 1) gives a flash of red.

C. L.

ALCOCK (A. W.). **The Anopheles Mosquito in England.**—*Lancet.* 1925. July 4. pp. 34–35.

In view of the alarming prophesy that epidemic malaria impends in England unless anopheles be immediately exterminated, Alcock points out that anopheles, and malaria for that matter, are as native to this country as sparrows, that "the bill of mortality for the London area for the year 1665 included 5,257 deaths from 'fever and ague'," and that it is to improvement in general sanitary environment, with no thought of mosquito or the plasmodium, that the disappearance of malaria from England must be attributed, since 50 larvae may even now be caught with one dip of a cup in July and innumerable adults in a stable in October within a few hours of London. The improvement is mainly attributable to "two outstanding items of sanitary improvement that most seem to have worked together . . . namely drainage and generally improved housing." Note this comment on the zoophil suggestion, in England. "There is no general concord of evidence that the insect prefers the blood of cattle to that of horses, or pigs, or rabbits, or man, though there would perhaps be more general agreement that it prefers a cattleshed or a stable, even when empty, to a well constructed house, even when it is inhabited.

C. L.

SWELLENGREBEL (N. H.) & HONIG (P. J. J.). **Bijdrage tot de geschiedenis der malaria in Nederland.** [Contribution to the History of Malaria in the Netherlands.]—*Nederl. Tijdschr. v. Geneesk.* 1925. June 6. 69th Year. 1st Half. No. 23. pp. 2538–2555. [62 refs.]

One of the authors has been asked why malaria has disappeared (or dwindled into insignificance) in the Netherlands, of which THYSSEN could write in 1824: "If we exclude Italy there is perhaps not a country where intermittent fevers are so malignant." The answer entailed inquiry into the historical material available. The present publication deals only with some aspects of the more interesting and well-known epidemics, viz., the Walcheren epidemic of 1809 among the British expeditionary force and the Groningen epidemic of 1826 (a part of the widespread pandemic of that year).

The writers conclude that such epidemics, the "swamp-fevers" of contemporary authors, all had some common etiological factors of which marshy soil was not always the most important. Such factors were: Overcrowding, as by introduction of labourers to carry out land reclamation, or of soldiers during war; insufficient or absent medical assistance, hospital accommodation, water supply and scavenging; and unsatisfactory nutrition of the population. These "swamp-fevers" were, indeed, a complex of diseases, among which it is sometimes possible to trace, besides malarias, paratyphoid (perhaps also typhoid), dysentery, pulmonary affections, perhaps influenza, and typhus fever, sometimes even relapsing fever.

Nothing remains of this complex but a few cases of a benign tertian malaria (occasionally increasing to distinct epidemics) equally harmless now as in former years. This disappearance is almost entirely due to general sanitary and social improvement including such measures as check intestinal and vermin-borne disease. The only traceable anti-malarial measures are the improvement of rural medical assistance, and cheaper and therefore more widely used quinine. Possibly, too, improved hygiene has helped to lessen the severity of malarial attacks, and better housing has decreased the chances of infection within human habitations.

N. H. Swellengrebel.

RUDOLF (G. de M.). **The Incubation Period of Benign Tertian Malaria.** —*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 219–233. With 6 charts. [22 refs.]

The incubation period of naturally acquired malaria is generally given as 6 to 21 days. In 37 cases in the literature following deliberate anopheline infection 7 to 30 days elapsed before the first appearance of parasites and 7 to 25 days before that of fever. In

50 general paralytics subcutaneously injected with *P. vivax* the temperature within the first 21 days overstepped 101° F. in 90 per cent., and 103° in 84 per cent. After subcutaneous injection there was found marked correlation between the first rise over 101° and KORTEWEG's chart showing the first finding of parasites in thick films; and a correlation too between the first rise of over 103° and the first findings in thin films.

The incubation period after intravenous injection was, in 60 cases collected from the literature, 1 to 19 days, and after 29 intramuscular injections at Bexley and Winwick Mental Hospitals, 6 to 23 days.

That the incubation period, judged by the first detection of parasites, tends to vary inversely with the dose is shown by the results of inoculating different quantities of the same properly suspended blood, equal quantities giving almost identical incubation periods. The intervals between injection and first fever were not so exactly correlated.

C. L.

INGRAM-JOHNSON (R. E.). **Dengue *v.* Malaria.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 16. Vol. 28. No. 6. pp. 126–128.

Returning to this theme (this *Bulletin,* Vol. 19, p. 579 (JOHNSON), and Vol. 20, p. 299) the writer records these further notes. In the search for undoubted clinical dengue he migrated from Colombo to Rangoon, and thence to the F.M.S. He there obtained blood from such a case, the serum from which was certified as sterile at the Institute of Medical Research at Kuala Lumpur. Of this he injected 1 cc. into each of 4 malarias, the diagnosis being evidently microscopic, but the kind of parasite unspecified. Quinine was entirely withheld. In three cases recovery was deemed complete, in the fourth a second injection was first required. Two controls received the same injection and were among the very few of the two or three hundred coolies who did not report with malaria. In two more cases, one the European Manager, similar treatment cut out, over an observation period of 5 months, microscopically established malaria which had previously appeared monthly. In 3 boys diminution of the enlarged spleen, to a degree held unique, followed a series of three serum injections. The effect on acute malaria was not tested.

The suggested explanations—that dengue is a modification of malaria brought about by a degeneration of the malarial parasite after its ingestion by the dengue-carrying mosquitoes, and that dengue serum is a natural vaccine against malaria—clearly constitute a quite separate question.

C. L.

SEGUIN. **Prophylaxie et traitement du paludisme. L'enseignement d'un séjour au Soudan.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Sept.-Oct.-Nov.-Dec. Vol. 22. No. 3. pp. 365–377.

Seguin restates his malarial belief—that gametes do not appear for 10 (usually not for 20 or 30) days after infection; that they can produce schizont parthenogenetically; that if, before they form, treatment be instituted in dosage of 5 cgm. per kgm. per day (say 50 grains for a man) for 3 days, and 3·75 cgm. for 7 days the infection is certainly destroyed. If gametes have formed, the duration of treatment must be 30 to 60 days. The duration is determined in either case by the presence or absence of parasites in the peripheral blood, they, it is held, being inevitably detected by examination of a thick film on each of two consecutive days.

C. L.

CIGNOZZI (Oreste). **Malaria e litiasi biliare. Deduzioni anatomo-clinico-statistiche.**—*Riforma Med.* 1925. July 13. Vol. 41. No. 28. pp. 652–655.

A connexion between malaria and gallstones is held evidenced by the finding of an enlarged spleen in 50 per cent., and a history of recent fever in 30 per cent. of the latter cases. Epidemic malaria in 1924 was followed by more numerous operations for cholelithiasis in 1925 than had ever before been noted.

C. L.

GRASSI (Battista). **Se i reperti di semilune siano sufficienti per spiegare l'epidemiologia delle febbri estivo-autunnali.** [The Finding of Crescents and the Epidemiology of Aestivo-Autumnal Fever.]—*Rend. R. Accad. Naz. Lincei.* Rome. Classe sci. fisiche, matemat. e naturali. 1923. June 17. Vol. 32. No. 12. pp. 583–587. [1 ref.]

As, indeed, the nomenclature testifies, a thousand reasons had convinced Grassi that at least three species of malaria parasites exist. Study of the subtertian malaria epidemic in the Roman Campagna altered his opinion, and that for the following reasons :—

At the time when new subtertian infections begin, tertian gametes are common, while crescents are entirely absent or very rare. Subtertian fever rapidly increases in prevalence, while crescents continue very scarce, and only gradually become sufficiently abundant. Various hypotheses were weighed, as follows, in the attempt to explain these phenomena.

Crescents exist in those who are without trace of fever—excluded by examination ; crescents are few, but would be detected on examination of a thick film—excluded by examination ; crescents are selected from the blood by the mosquito by a chemical taxis—no evidence forthcoming ; the first subtertian cases are relapses—demonstrated as without foundation ; anopheles surviving from the previous year carry on subtertian infection—impossible ; direct anopheline carriage of parasites from man to man misses the sexual phase—rejected on accurate experiment. A process of exclusion leads *in our present state of knowledge** to the conclusion that the subtertian epidemic must be due either (1) to infection apart from mosquitoes—a supposition contradicted by thousands and thousands of facts, or (2) that there are not 3 but 1 species of malaria parasite, the forms passing exceptionally into one another. Grassi indeed claimed that he had observed the penetration [not necessarily the fertilization] of a female tertian by a male subtertian gamete, an observation not published at the time, but awaiting the hope of its recurrence being noted.

[Regretfully in the circumstances, it must be indicated that it is not possible to agree with the exactness of either the process of exclusion or of reasoning.]

C. L.

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* The passage is italicized in the original.

RUBITSCHUNG (Otto). **Die Wiederholung des Kurventyps der Leukozyten für akute Infektionen bei jedem Anfall von Malaria tertiana.** [The Leucocyte Curve of Acute Infections of Tertian Malaria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. May 1. Vol. 29. No. 5. pp. 217–243. With 5 charts in text. [14 refs.]

From observation of seven cases of injected tertian malaria the writer concludes that there occur prodromal variations in the leucocytes: with the rigor a neutrophil increase with Arneth shift to the left; with the crisis a monocytosis; and in the interval a lymphocytosis. The shift to the left begins immediately after inoculation.

C. L.

LARREGLA (Santiago). **Estudio hematológico de treinta palúdicos.**—*Siglo Médico.* 1925. June 27. Year 72. Vol. 75. No. 3733. pp. 656–659.

Of 30 invalided cases investigated in Madrid most were tertian, quartan came next in frequency, and in 2 cases crescents were found. Leucocytes averaged 4,100, while the average differential counts in and between attacks were for lymphocytes 44·3 and 42·1, for large mononuclears 6·8 and 8·4, for polymorphs 47·1 and 47·6. Arneth's count showed a shift to the left. Erythrocytes averaged 4,500,000, and haemoglobin 48 per cent.

C. L.

JONESCO (D.) & POPPER (M.). **Sur la cirrhose hépato-splénique paludéenne. A propos de l'article de M. Millous: "L'hépatite scléreuse atrophique ascitogène métasplenomegalique paludéenne."**—*Paris Méd.* 1925. Mar. 14. Vol. 15. No. 11. pp. 253–254. [2 refs.]

Disagreement is expressed with the identification of Banti's disease with malarial hepatitis and splenic cirrhosis. In the former there is progressive fibrosis of the Malpighian follicles and loss of the germinative centre which is frequently replaced by hyaline masses with sometimes thrombosis and fibrosis of trabeculae. In malaria there is not.

C. L.

GAGE (A. T.). **Note from a Cultural and Commercial Point of View on the Use of Cinchona Alkaloids in the Treatment of Malaria.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 18. No. 7. pp. 345–352.

LANE (Clayton). **On Certain Aspects of the Use of Cinchona and its Alkaloids in the Treatment of Malaria.**—*Ibid.* pp. 352–358. (Discussion pp. 358–369.)

This discussion, originating in a Critical Review (this *Bulletin*, Vol. 21, p. 849), was inaugurated by Col. Gage. Passing from north to south there occur in the Andes the natural habitats of *Cinchona succirubra*, *C. officinalis* and *C. calisaya*. The first alkaloid separated from the bark being quinine, and its therapeutic effectiveness being so marked, there was brought about the substitution in already started plantations of *C. officinalis* and *C. calisaya*, rich in quinine, for the robust but poor *C. succirubra*. From this last, originally planted in India, there had been produced the Indian cinchona febrifuge as the total alkaloidal precipitate from the bark, and when, under the demand for quinine, it was replaced by *C. ledgeriana* and its hybrid with *succirubra*, quinine was separately extracted from the bark, and it was the residual alkaloid and not the total alkaloid which was henceforward sold as cinchona febrifuge. This in 1922 had the following general constitution :—

Amorphous alkaloid .	33	Quinine	10.5
Cinchonine .	23	Non-alkaloid ..	1·5
Cinchonidine	7	Insoluble	3
Quinidine . . .	16	Water	6
			100

In 1913 was instituted the first agreement between the Java planters and the quinine manufacturers (90 per cent. of bark comes from Java), with an immediate rise in the price of quinine. As a direct result of the preponderating demand for quinine rather than for the other alkaloids of cinchona, selection in planting has given to the barks of *C. ledgeriana* and its hybrid with *succirubra* the following constitution :—

	C. ledgeriana.		*C. ledgeriana* x *succirubra.*	
	Percentage in stem bark.	Proportions of alkaloids.	Percentage in stem bark.	Proportions of alkaloids.
Amorphous alkaloid ...	0·60	10·4	0·54	11·9
Cinchonine ...	0·25	4·3	0·46	10·1
Cinchonidine ...	0·36	6·2	0·33	7·3
Quinidine ...	0·44	7·6	0·34	7·5
Quinine ...	4·14	71·5	2·87	63·2

If there now arise a demand for alkaloids other than quinine, their shortage will cause a repetition of the conditions which arose in India in 1875—a demand for these alkaloids as the result of the recommendations of the 1866 Commission causing a rise in their price out of all proportion to their therapeutic value. Such a demand could only be met by selection and growth, over a term of years, of trees whose bark is rich in the desired constituent. In view of the serious cultural and commercial consequences involved it was urged that no such demand should be made without clear evidence of its desirability. It was further urged that the most promising means of rapid increase of the world's cinchona alkaloids lay in the planting of *C. succirubra*, a robust species and one yielding more bark than others ; the extraction of the total alkaloids as cinchona febrifuge, a cheap and rapid process ; and, by mixture of bark on a sufficient scale aided, in time, by selection of trees, the production of an alkaloidal mixture with a reasonably steady composition.

Clayton Lane pointed out that we know almost nothing regarding the varying concentration of quinine in blood, nothing exact as to the time relation of this to dosage, and have no evidence that extracorpuscular stages of malaria parasites are more vulnerable than others. He suggested that in cultures containing increasing percentages of quinine it should be possible to observe whether development were checked at the extracorpuscular stage, and, if this were so, whether the concentration concerned had any relationship to that which is found in the circulating blood after administration of quinine. If, however, it were not quinine but, as the facts suggest, some metabolite which was plasmodicidal, then the more quinine excreted in the urine, the less metabolite was presumably formed. On the same supposition, since metabolism of quinine is effected principally in the intestines, liver and kidneys, the drug's efficacy would depend, not on its solubility, but on the facility for metabolism of the form used. He asked for information as to the effect of sugar coating of tablets. Did it make them, as the French suggest, insoluble? Was amorphous alkaloid a varying mixture of active and inert substances? What is the reason for the varying reports on the intramuscular injection of quinine?

Mr. Bernard HOWARD said that a sugar coating is distinctly porous; a hygroscopic salt will burst this, with blame to the manufacturers. Under the sugar an impervious subcoat is accordingly used. From the chemist's point of view he deprecated the return to an unstandardized cinchona febrifuge.

Sir David PRAIN gave his experience that cinchona febrifuge was more potent than quinine, and amorphous alkaloid than the febrifuge.

Professor SWELLENGREBEL noted his experience of tablets with a relatively insoluble coating. In Holland rapid and permanent cure is effected by quinine in cases having had 15 to 20 paroxysms.

Mr. JOWETT emphasized that no pure sugar will remain without discoloration in the tropics. He had analysed coatings containing 100 per cent. of French chalk. A coating can be tested readily and simply by dropping the tablet in water and watching the result.

Sir Leonard ROGERS noted the observation that intramuscular injection of quinine never gave cinchonism as evidence of slow absorption.

C. L.

ACTON (H. W.) & CHOPRA (R. N.). **The Concentration of Quinine in the Circulating Blood.**—*Indian Jl. Med. Res.* 1925. July. Vol. 13. No. 1. pp. 197–204. [7 refs.]

It being held that quinine cures subtertian malaria more readily than tertian because sporulation of *P. falciparum* occurs in the mesenteric vessels, and that it acts best in an alkaline medium, further experiments to test these points were undertaken on cats. These received, by mouth, or injected by needle into the stomach or intestine, 0·1 gm. of quinine as base or as bihydrochloride, and blood from the mesentery was tested for quinine at intervals of half, one, and two hours, the amounts being estimated as quinine base. Considering only comparable experiments, in one cat the injection of the bihydrochloride into the mid-ileum gave in "the mesenteric blood" 0·01, 0·008 and 0·072 gm. at the intervals noted; while the mean concentrations in two others (after a preliminary mid-ileum injection of a drachm of sodium bicarbonate and 45 minutes later one of quinine base) were 0·0182, 0·0156 and 0·0134. It is concluded that the administration of alkalis before quinine nearly doubles the quinine concentration in the mesenteric blood. [In view of the weight which these experiments will carry in India it seems obligatory to point out that there was more than one variant in the two sets. The alteration in the kind of quinine introduced an alteration in solubility, and in the quinine content to the extent of 20 per cent. The introduction of a drachm of bicarbonate of soda implies the injection of at least 11 drachms of water, which was not duplicated. Presumably the exposure of the intestines was 45 minutes longer in one set than in the other.]

Injections into the intestine of alkali and quinine base produced concentrations, in milligrammes per cc. of quinine base, amounting in mesenteric blood to 0·014, 0·0152, 0·015 and 0·015, while those in the jugular vein were respectively 0·01, 0·007, 0·008 and 0·01. It is concluded that quinine concentration is greater in mesenteric than in systemic blood, probably owing to the absorptive action of the liver. The mere dilution of portal by systemic blood would, however, presumably produce a greater effect than that noted.

C. L.

BELONOVSKY (G. D.) & BALKOVSKY (A. A.). **Essai de traitement du paludisme par la quinine opsonisée.**—*C.R. Soc. Biol.* 1925. June 26. Vol. 93. No. 22. pp. 152–153. [1 ref.]

The writers believe that quinine only acts when there are present in the blood " opsonins " to attach it to red corpuscles. These they believe they obtain by drawing off blood into a syringe containing 1 cc. of splenic extract and 2 cc. of 50 per cent. quinine bihydrochloride, mixing, and reinjecting after 2 or 3 minutes. The blood must be drawn during a paroxysm, for parasites must be present in numbers. Injections are repeated with every access. After the third injection the temperature generally falls.

C. L.

URCHS (Oswald). **Beobachtungen mit der Chinindarreichungsmethode nach Ochsner.** [Quinine given by Ochsner's Method.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. June 1. Vol. 29. No. 6. pp. 283–287.

OCHSNER's method of giving quinine every two hours for 30 doses was tested in Dutch Guiana in 59 cases (11 tertian, 8 quartan, 20 subtertian and 20 in which no parasites were found). Defervescence was not accelerated, quinine discomfort was increased, relapses were more frequent, and natural immunity judged delayed.

C. L.

GRIFFITTS (T. H. D.). **Eight Weeks' Quinine Treatment for Malaria. A Report of Results as observed in a Community with a High Malaria Incidence, in Dale County, Alabama.**—*Public Health Rep.* 1925. Mar. 20. Vol. 40. No. 12. pp. 539–548. With 2 text figs.

A marked instance of man-made malaria emanating from a reservoir established for power purposes in 1921. Early in 1923, with no anopheles yet reported, and none caught after careful search, thick smears from 87 persons showed 32·2 per cent. infected, 17 with tertian, six with subtertian, four with both these forms, and one with quartan parasites. Of infected cases, 57·1 per cent. showed gametocytes. The United States 8-weeks Standard Treatment was administered from June 19th onwards. Of 7 who took 95 per cent. of the full treatment, 42·9 per cent. were found infected within 10 days of its completion. Of 19 taking 90 per cent. the figure was 21·2; of 15 taking 80 to 90 per cent. it was 26·7; of those taking 50 per cent. 11. *A. maculatus* reached a maximum of 11 per house.

C. L.

McRobert (G. R.). **Intramuscular Quinine.** [Correspondence.]—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 140–141.

Emphatically dissenting from the extreme statement that the intramuscular injection of quinine should be held malpraxis [this *Bulletin*, Vol. 22, p. 403], McRobert, while agreeing that the systematic pumping in of a tissue-destroying substance is unsound, points out that where vomiting prevents oral administration, and excessive fat prevents intravenous medication, the choice lies between exposing a vein and giving an intramuscular injection. " Except in desperate cases the latter method is the lesser of two evils."

C. L.

Fletcher (William). **Rectal Injections of Quinine.**—*Bulls. Inst. Med. Research, Federated Malay States.* 1924. No. 1. 20 pp. With 10 figs.

The conclusions reached by the author regarding the rectal administration of quinine [this *Bulletin*, Vol. 20, p. 970] were so contrary to accepted opinion that the Colonial Advisory Medical and Sanitary Committee suggested that the symptoms occurring might be due to some unrecognized factor. Fletcher has accordingly retested the matter. The evidence, impartially marshalled, is as follows. Quinine bihydrochloride from Howards & Sons was used throughout.

A 25 per cent. solution rectally injected into guineapigs was not retained—not absorbed, as is evidenced by survival after ten times the lethal dose. Asiatic patients, encouraged by a reward of more than a day's pay for the best stayer, retained 2½ to 5 grains per ounce for longer than 20 minutes in only 12 of 103 tests, the record established being 35 minutes. A healthy European, believing they were not really trying, accepted per rectum 20 grains in 4 ounces of salt solution, but retired beaten in 10 minutes.

Absorption of quinine by rectum, as judged by the effects of Mayer's reagent on the urine was poor, irregular and unreliable (as a number of photos testify), and as judged by the effect on parasites in the blood undependable, for in 11 of 16 cases parasites, comprising all species, were still present after a week's treatment, but disappeared speedily and without exception on using oral administration. Photos of a number of test tubes containing shreds and mucus picked from enema results are figured. It is concluded as before that " quinine is too irritating for administration per rectum. It should not be given by this route if any other means are available." The evidence, which seems singularly convincing, merits careful study in the original.

C. L.

Marchoux (E.). **Action exclusive de l'arsenic (stovarsol) sur le paludisme à** *Plasmodium vivax.*—*Ann. Inst. Pasteur.* 1925. Mar. Vol. 39. No. 3. pp. 197–208. [40 refs.]

Seven persons inoculated with benign tertian malaria were treated with a single intravenous injection of sodium stovarsol, equivalent to about 0·75 gm. of acetylaminophenylarsenic acid. The older pigmented plasmodia disappeared first leaving the erythrocyte unharmed, for such are to be found with Schuffner's dots still evident. No parasites were found after 24 hours. Three cases relapsed within 2 months. In 12 natural infections with *P. vivax*, similarly treated, plasmodia rapidly disappeared. In 11 infections with *P. malariae* and 12 with *P. falciparum* no change occurred in the parasites. Treparsol, and more so stovarsol urethrane, produced toxic symptoms. It is pointed out that such a pharmaceutical difference constitutes another evidence of specific distinction.

C. L.

WHITTINGHAM (Harold E.). **The Treatment of Malaria by Novarsenobillon.**—*Proc. Roy. Soc. Med.* (War Section.) 1925. Aug. Vol. 18. No. 10. pp. 23–31. [7 refs.]

Of 93 benign tertian malarias treated in England 78 received novarsenobillon with 41 per cent. of relapses, 5 received quinine with 60 per cent. and 10 both drugs with 30 within 8 weeks of ceasing treatment. NAB dosage was mainly by injections of 0·45 gm. weekly for 6 weeks and then 3-weekly for 3 months. Quinine dosage was 30 grains of the hydrochloride daily by mouth for a week, 20 grains for 4 weeks, and 10 grains for 8 weeks. Quinine, on collected evidence, is held to clear parasites from the peripheral blood in 3 to 4 days, while NAB does it in one. Relapse percentages within three weeks of ceasing treatment are quoted from ACTON, STEPHENS, and JOHNSON as 75, 54 and 23·8 respectively; while Whittingham's for NAB are 29. "There is no uniformity in the results of quinine treatment." The unstated inference is that there will be for NAB.

In discussion POWELL and MACARTHUR pointed out that malaria will develop in those undergoing treatment by salvarsan, which could not be relied upon to check malaria.

C. L.

PITSCHUGIN (P. I.). **Das Methylenblau bei Behandlung von Malaria bei Kindern.** [Methylene Blue in the Treatment of Malaria in Children.]—*Jahrb. f. Kinderheilkunde.* 1925. May. Vol. 108. No. 5–6. pp. 347–353. [17 refs.]

If a week in bed without other treatment did not cure *P. vivax* infection the children were given in addition, three times daily for seven days, a centigramme of methylene blue and of nutmeg for each year of age. Consequent changes in the parasites are noted. Fever ceased in 3 to 5 days. Parasites disappeared. Stomach, intestines and kidneys were unaffected. No relapses occurred. Treatment of walking cases was not so successful.

C. L.

BOYD (J. E. M.). **Carbolic Acid in Malaria.**—*Jl. Roy. Army Med. Corps.* 1925. Aug. Vol. 45. No. 2. pp. 138–139.

Of 3 cases in which carbolic acid was administered crescents disappeared in one, diminished in another, while in the third the effect on them is not noted. The dose advised is 1 minim, with

1 minim of tincture of iodine, three times daily for three days, whereupon the doses are increased to two minims for three days, and to three for another 4 days.

C. L.

KORTEWEG (P. C.). **Over kwikbehandeling van malaria.** [Mercury in the Treatment of Malaria.]—*Meded. v. h. Rijks-Inst. v. Pharmaco-Therap. Onderzoek.* 1925. No. 9. pp. 7–11. With 1 chart in text. [4 refs.]

Five general paralytics were given their first inoculation with tertian malaria and from that day received a daily injection of 10 mgm. of perchloride of mercury. Malaria appeared as usual and was allowed to run to 12 paroxysms, the mercury being religiously continued, after which a gramme of quinine put an end to the manifestation, as the chart dramatically shows.

C. L.

MALARIACOMMISSIE VOOR NOORDHOLLAND. **Jaarverslag der Wetenschappelijke Malariacommissie voor Noordholland over 1924. (Uitgebracht aan den Minister van Arbeid, Handel en Nijverheid.)** [Annual Report for 1924 of the Scientific Malarial Commission for Noordholland.] [ALDERSHOFF (H.), Chairman, KORTEWEG (P. C.), Secretary.]—34 pp. With 1 chart in text. 1925.

BUREAU POUR L'ENCOURAGEMENT À L'EMPLOI DE LA QUININE, AMSTERDAM.—**Smalarina Cremonese ce qu'on en pense aux pays-bas et aux Indes Néerlandaises.**—46 pp. 1925.

The regular work of the Commission has been carried through with the usual thoroughness. Perhaps the most generally interesting part of the report is the summary it gives of Dutch findings regarding smalarina, much of the detailed information regarding which is obtained for this abstract from a pamphlet, issued by the "Bureau pour l'encouragement à l'emploi de la quinine," Amsterdam, which consists of a series of reprints of papers by Dutchmen of responsible position published without further comment.

In Communication 8 of the State Institute for Pharmaco-Therapeutical Research signed by the Institute's President and Secretary it is noted that smalarina packets bear the intimation that each tablet contains mercury 0·00153, antimony 0·0031, iodine 0·0097 gm. in organic combination. The writers' analysis confirms the weights, but, since they could separate iodide of mercury *mechanically*, disposes of the question of organic combination. CREMONESE refused to the North Holland Commission any information as to the composition of the remedy. Indeed, a circular by the "Societe in Accomandita Consorzio Neoterapico Nazionale," of Roma, which informs the public that Smalarina Cremonese has been tried in many parts of the world with brilliant success, states that no one but Professor CREMONESE knows its composition. Evidence of the efficacy of smalarina is offered by CREMONESE in the statement that there are found in the blood necrotic macrophages containing necrotic benign tertian parasites. The Commission confirms HAGA, of Weltevreden, Java, in the conclusion that these bodies are but improperly stained erythrocytes with Schuffner's dots, drawn on that generous scale necessary to uphold their new dignity. In such cases as were clinically tested, parasites persisted until quinine was given. Finally smalarina is held to act only several months after its exhibition, and to depend for its efficacy on the season, while all opposition is held as biassed enmity. There is much caustic writing in the pamphlet, and considerable amusement to be derived from its perusal.

C. L.

LOW (George C.) & GREGG (A. L.). **" Smalarina " in Malaria.**—*Lancet.* 1925. June 27. pp. 1339–1341. [1 ref.]

One case of benign tertian and two of tertian malaria were confined to bed and given the full course of smalarina lasting 32 days. In no case did the parasites alter in appearance or disappear; nor was the fever controlled. On the contrary, in the two subtertian cases, the grave condition supervening necessitated the giving of quinine once or twice during the smalarina course. " Smalarina appeared to have absolutely no effect of a beneficial nature."

C. L.

FERRARI (Antonino). **A Dosagem da quinina na urina e seu valor na clinica.** [The Estimation of Quinine in the Urine and its Use in Practice.]—*Rev. Med.-Cirurg. do Brasil.* 1925. May. Vol. 33. No. 5. pp. 253–256.

The author used Giemsa's solution—equal parts of sublimate 18/000 and potassium iodide 200/000 –for estimating the excretion of quinine. On addition of the patient's urine a bluish white disc appears at the line of contact. If this forms in one minute the urine contains 1 : 25,000 quinine; in two, three, or five minutes 1 : 30,000, 1 : 40,000 and 1 : 50,000 respectively. If there is albumen the urine must be rendered free by boiling. Half a gramme by mouth begins to be eliminated in 30 minutes and reaches a maximum in 8 hours; by intramuscular injection, in 15 minutes with a maximum between the sixth and ninth hours; intravenously administered it appears in 5-10 minutes and ends in 18-21 hours. The total amount eliminated varies normally between 25 and 75 per cent. If the amount is below 15 per cent. the outlook is bad, if above 75 per cent. there is hypersensitiveness to quinine. The test is of value as indicating the absorptive power of the stomach when the drug is given by mouth, and also the activity of the renal function.

H. Harold Scott.

SERGENT (Et. & Edm.) & CATANEI (A.). **Etude expérimentale du paludisme des oiseaux** (*Plasmodium relictum*). **Suite des essais de traitement par des produits autres que la quinine : cinchonine (XXVIII^e Note).**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 443–454. With 6 charts in text. [2 refs.]

—— & ——. **Résumé des essais de traitement préventif ou curatif par les alcaloides du quinquina (XXIX^e Note).**—*Ibid.* pp. 455–457. [6 refs.]

The first, and certain previous, papers are summarized in the second, as follows. They refer to *P. relictum* in canaries. Quinidine proved too toxic to use.

	Quinine.	Cinchonine.	Cinchonidine.
Fatal dose—			
Single	6 mgm.	3 to 4 mgm.	4 mgm.
Repeated daily ...	1 mgm. kills about 25th day.	1 mgm. killed 5 of 12 about 20th day, 2 mgm. killed 3 of 3 about 30th day.	2 mgm. kills from 10th day to 20th day.
Curative dose	With 2 to 4 mgm. parasites disappear in less than 48 hrs.	The similar dose is 3 to 6 mgm.	Toxic doses are required.
Preventive dose ...	0·7 mgm. daily.	1 to 2 mgm. daily, but less effective than quinine.	0·8 to 2 mgm., but less effective than quinine.
Action on splenomegaly	0·7 mgm. daily, effect marked.	No effect.	1 to 3 mgm. Effect very marked.

BARBER (M. A.) & KOMP (W. H. W.) with the Co-operation of CLARK (H. C.). **Report on some Malaria Work done in the Tela and Guatemala Divisions. January-February, 1925.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1924. pp. 213–223. With 1 fig.

The method of Barber and Komp of staining thick films without previous decolorizing (*ante* p. 406) gave 27·7 per cent. of positives, as against 18·9 with thin films. The time spent on the former "probably did not average over 3 minutes." Clark, who was responsible for the statement that young rings did not stain by this technique, has had advantage of two months' work with the other writers and, in a personal communication, corrects his previous statement, as follows:—

"My technique was corrected and very excellent results gained in staining all stages of the malarial parasites. The stain used can give wide variations in results, but a good Giemsa stain such as Grubler's Azur II Eosin and Azur II prepared as they direct is satisfactory. A good Leishman's stain serves well also. The next important step is to use water with a proper pH such as is present in freshly-caught rainwater (not from a roof) or at least a water with a range of 6·6 to 7·6 pH. The method deserves general use where large number of persons are being regularly examined, and many cases will be detected that are missed by using the thin film method of examination. It permits the use of a much thicker film than I have ever been able to decolorize by any of the old acid-alcohol methods."

C. L.

DE LANGEN (C. D.) & ROSKOTT (E. R. A. Luyke). **Bijdrage tot de kennis van de verhouding tusschen erythrocyt en malariaparasiet. (Zij ligt *op* en niet *in* de roode bloedcel.)**—[Relation between Erythrocyte and Malaria Parasite. It is situated *on* and not *in* the Red Bloodcell.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 141–149.

Contrary to SCHAUDINN'S opinion and in accordance with LAVERAN'S views on this subject, the authors' investigations led them to the conclusion that the malaria parasite does not enter the red cell, but attaches itself to the surface of the chromocyte, or lives in the membrane of the cell. This cell membrane consists of lipoids, especially cholesterol and lecithin. BRINKMAN and VAN DAM showed that these substances can be washed away separately. The authors succeeded in washing away the lecithin from the cell membrane, using a specially adapted Ringer's solution. By careful technic, for the details of which the original paper should be seen, haemolysis could be prevented. In films made of samples of blood containing numerous tertian or subtertian parasites after this treatment the cells containing parasites were found to be rare, whilst free mature parasites were seen. The subtertian parasite attached itself more firmly to the cell membrane than the tertian.

W. J. Bais.

PEREKROPOW (G. I.). **Zur Frage ueber die lytische Wirkung des Blutserums von Kranken auf Malariaparasiten. (Ueber Schizontolysinen Abrami u. Carnot.).** [Lytic Action of the Blood Serum of Patients on Malarial Parasites.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 155–159. [13 refs.] German summary pp. 221-222.

Blood removed immediately before an attack did not culture, during the onset might grow to 2 generations, rather later in the attack gave better results, and after the attack cultured well. The presence of parasitic degeneration showed that the failure to grow was not due to phagocytosis. It is held to be due to antibodies in the serum. The evidence offered is that, substituting for the patient's serum that of one who had never had malaria, culturing was good, and it was nearly as good if the man's own serum, heated previously to 55° or 56° C. were substituted for his untreated serum.

C. L.

NICLOT (V.). **A propos de l'emploi préventif de la quinine dans le paludisme.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 268–271. [2 refs.]

The head of the French Base Hospital at Salonica with its 20,000 beds recounts the widespread evasion of thé taking of prophylactic quinine, only checked by surprise demands for urine. A medical unit is instanced where the vice of those who deliberately abstained from prophylactic quinine was suitably punished by their becoming the only prey of the plasmodia.

C. L.

LEGENDRE (J.). **A propos de l'efficacité de la quinine préventive.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 272–278. [7 refs.]

Legendre returns to this matter. A fifth of a food ration is admittedly useless. If it be maintained that a fifth of a curative quinine ration is insufficient to prevent malaria, the curative effect of a full ration is not thereby questioned. The estimated value of prophylactic quinine rests too much upon uncontrolled Authority. It is illogical to suggest, for example, that because only 20 per cent. of immigrant newcomers, all taking prophylactic quinine, become infected with malaria, quinine has protected 80 per cent. of them. The other preventive measures, taken by individuals, must be known, and the whole must be controlled by the infection rate of those other unprotected newcomers, the indigenous infants. In addition to the literature in English on the Macedonian Campaign and on the Panama Canal Zone, stress is laid on the brothers SERGENT'S failure to protect canaries from *P. relictum* with prophylactic doses of quinine equivalent to 2 gms. daily in a man, and on Warrington YORKE & MACFIE'S and HANSCHELL'S similar experience in man.

C. L.

FOLEY (H.) & BROUARD (M.). **Action comparative de la quininisation prolongée à petites doses sur** *Plasmodium praecox* **et** *Pl. vivax* **chez les indigènes porteurs de germes.**—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 958–960. [1 ref.]

Among 70 children, of whom in April, 1924, 14 carried *P. falciparum* and to whom quinine sulphate was given for six months in daily doses of 0·1 to 0·4 gm. according to age, none showed the parasite in December, although 27 had done so in the previous December. One smear and three thick drops were made for each examination.

C. L.

SÉGUIN (T.). **Note sur la prophylaxie quinique du paludisme.**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 153-157.

Prophylactic quinine should be taken in one daily dose of 0·5 gm. with the evening meal and at no other time. "It is, moreover, probable that it is easier to destroy a small number of sporozoits on their introduction into the vessels than schizonts more or less inured to quinine, or than merozoites formed from them and without doubt more or less quinine resistant as they are." [Warrington YORKE & MACFIE'S work would show that sporozoits are quinine resistant, and schizonts are not. (This *Bulletin, ante* p. 50.)]

C. L.

NICOLAÏ (A.). **Ervaringen met de vierde-daagsche chinine-kuur als prophylacticum tegen malaria.** [Experiences with the Fourth Day Quinine Prophylaxis against Malaria.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 50–54.

Nicolaï used ZIEMANN'S quinine prophylaxis in 556 coolies on three estates during one year (1923). The malaria rate in this group was 40 per cent. less than in 1922. In the non-treated control group (3,163 coolies on 11 estates) the malaria rate decreased by 25 per cent.

in 1923 in comparison with 1922. Considering only new infections, *i.e.*, patients who had not suffered from malaria during the previous 1½ years, there was practically no difference in the malaria prevalence in the two groups (decrease of 36 per cent. against 40 per cent. in the controls). The number of relapses decreased by 41 per cent. in the treated, by 22 per cent. in the non-treated group. The author ascribes this difference to the quinine prophylaxis. ZIEMANN founded his fourth day quinine prophylaxis upon MARIANI's finding that quinine could be detected in the urine of patients during 3 days after administration of 1 gramme of quinine hydrochloride. Nicolaï found that in two series of 99 and 25 patients quinine disappeared much more quickly from the urine.

As a prophylactic *sensu strictiori* quinine administration every fourth day is of little value ; it can to a certain extent prevent relapses, but not the new infections.

W. J. Bais.

PIJPER (A.) & RUSSELL (E. D.). **Observations on Inoculated Malaria.**—*S. African Med. Rec.* 1925. May 9. Vol. 23. No. 9. pp. 178–192. With 5 charts in text. [28 refs.]

Fifty cases of subcutaneously injected malaria, nearly all tertian, are dealt with. In contrast to the experience of BEN-HAREL with canaries (this *Bulletin,* Vol. 21, p. 138), there was evident an incubational rise in erythrocytes, both in number and in total bulk, which terminated with the detection of parasites in the peripheral blood. Stress is laid upon the presence of the initial fever described by KORTEWEG (*l.c.* Vol. 22, p. 54) ; indeed, those cases in which it does not occur are judged to be non-primary attacks. Spontaneous cure occurred in 44 per cent. of the cases; a circumstance which suggests that when, contrary to the experience of others whom they quote (HANSCHELL, *l.c.* p. 60), they believe they have found in two injections of novarsenobillon of 0·6 gm. each a *therapia magna sterilisans* for early tertian malaria, the explanation may be otherwise. Possibly the fact that two strains of tertian malaria were used, one producing mild, the other high fever, and that their distribution among the patients is not indicated, may be an essential factor. It is confirmed that no correlation exists between the number of parasites injected and those present in the circulating blood, nor between the latter and the degree of fever.

C. L.

LILLY (G. A.). [Reported by.] **The Treatment of General Paralysis at Hanwell Mental Hospital.**—*Jl. Mental Science.* 1925. Apr. Vol. 71. No. 293. pp. 267–278.

The strain of benign tertian malaria received from Endsleigh Gardens showed stronger reactions latterly, whereas the same strain passed on to Hanwell required "refreshing." No difference in effects was noted between 30 cases of subcutaneous injection and three cases in which infection was carried by Col. JAMES's mosquitoes. Treatment was by 2 grains of quinine sulphate 3 or 4 times a day for two months. "No signs or symptoms of malarial trouble reappeared after the first administration of quinine."

C. L.

ELDRIDGE (Watson W.), and a Committee consisting of LIND (John E.), SILK (Samuel A.) & TRENTZSCH (P. J.). **Treatment of Paresis: Results of Inoculation with the Organism of Benign Tertian Malaria.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 11. Vol. 84. No. 15. pp. 1097–1101. [1 ref.]

Of 64 cases inoculated subcutaneously with 2 cc. of blood obtained just after a paroxysm of benign tertian malaria, 10 never showed a paroxysm. The incubation period of the others was 7 to 34 days; the fever—quotidian, tertian, or irregular—subsided spontaneously in 17. Treatment was by 160 grains of quinine sulphate during 11 days. Two, from an unstated category, relapsed.

C. L.

HERRMANN (G.). **Jahresbericht ueber die Malariabehandlung der progressiven Paralyse an der Deutschen Psychiatrischen Klinik in Prag im Jahre 1924.**—*Med. Klin.* 1925. Mar. 13. Vol. 21. No. 11 (1057). pp. 395–398. [15 refs.]

In 60 cases of general paralysis inoculated with malaria, evidently tertian, two skin eruptions occurred: in a diabetic, urticaria coincident with fever; in one undergoing phlogetan treatment, extreme pallor followed by redness of the eyes and whole body. A man injected on 3rd had his first fever on 8th and died on 21st of September of a ruptured spleen, which weighed 750 gms. Failures to infect mosquitoes with these constantly injected strains are mentioned, and their consequent presumed hygienic safety is reiterated. [See, however, PLEHN, *ante,* p. 408.]

C. L.

CLARK (R. M.). **Treatment of General Paralysis by Malaria.** [Memoranda.]—*Brit. Med. Jl.* 1925. Mar. 28. p. 600.

SILVERSTON (J. D.). **Malarial Treatment of General Paralysis of the Insane. Ice Method of Inoculation.** [Correspondence.]—*Lancet.* 1925. Apr. 4. p. 737.

The technique of POTZL, of Prague. The sterile fluid from defibrinated malarial blood can be kept iced and infective for at least 65 hours, so that successful inoculation has been obtained from blood removed at Whittingham, Preston, and sent to London on ice. Parasites stain well after 7 days in the ice chest.

C. L.

i. RUDOLF (G. de M.). **The Malarial Treatment of General Paralysis of the Insane.** [Correspondence.]—*Lancet.* 1925. Apr. 11. pp. 793–794.

ii. ANTIĆ (D.). **Experimentelle Reproduktion der Malaria.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. May 1. Vol. 29. No. 5. pp. 203–216. [15 refs.]

iii. CLAUDE (Henri) & TARGOWLA (René). **Sur le traitement de la paralysie générale par le paludisme expérimental et les antisyphilitiques associés.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. June 4. Year 41. 3rd Ser. Vol. 49. No. 19. pp. 795–805. With 2 text figs. [1 ref.]

iv. TEN RAA (M. J.). **Malaria-enting bij dementia paralytica.** [Malarial Injection in Dementia Paralytica.]—*Nederl. Tijdschr. v. Geneesk.* 1925. July 25. Year 69. 2nd Half. No. 4. pp. 465–478. With 2 charts in text. [6 refs.]

v. JAGIĆ (N.) & SPENGLER (G.). **Mesaortitis luetica und Malariakur.**—*Wien. Klin. Woch.* 1925. July 30. Vol. 38. No. 31. p. 859. [5 refs.]

i. Defibrinated blood has travelled 170 miles by ordinary post and given satisfactory results.

ii. In one of four cases, inoculated in Belgrade, schizonts and gametocytes appeared within 48 hours of inoculation. No blood examination was, however, made before the inoculation, and two of the cases recorded were actually natural local infections with *P. falciparum.*

iii. Three of 30 tertian malarias subcutaneously injected relapsed after receiving 1 to 1·5 gm. of quinine daily for a few days.

iv. The usual experience. Occasional spontaneous disappearance, and general ready cure.

v. The malarial treatment of WAGNER-JAUREGG for general paralysis was applied in 19 cases which were judged by anginoid pains and other signs to have aortitis. The aortic symptoms benefited.

C. L.

BULLETINS DE LA SOCIÉTÉ DE PATHOLOGIE EXOTIQUE. 1925. Mar. 11. Vol. 18. No. 3. pp. 227–230.—**Instruction pratique pour la lutte contre le paludisme.**

A considered reply by French experts to a request from the Minister for the Colonies for an authoritative pronouncement on malaria prophylaxis. It intimates that the local expert sanitary service must be made responsible for local campaigns, which must be planned from the beginning in accordance with financial resources, and from which there should be no recession. The measures recommended, as all-essential, under special circumstances, are: antilarval, anti-imaginal (screening, nets, capture, animal protection), antiparasitic (quinine, preventive and curative). In different regions these have different relative values. Special emphasis is laid upon the need of incriminating the special local anopheline host. The daily prophylactic dose of quinine is put at 0·2 gm. (3 gr.), and 0·4 in special circumstances. But above all measures is placed productive betterment of the country, better and lighter housing, better food, regular life, all tending to increased bodily resistance.

C. L.

MAXWELL (C. N.). **Malaria Prevention and Farming.**—*Medical Bulletin.* Kuala Lumpur, F.M.S. 1923. No. 3. 4 pp.

A paper by Maxwell, of the Malayan Civil Service, giving food for thought. Krian provides an object lesson in correct farming, the right product—rice—planted in the right place—the coastal plain—in the right manner—the weathering of grass and rice stubble, its soakage, and its final incorporation in the wet soil; there being direct evidence by WATSON and LAMBOURNE " that the highly fastidious and exclusively select malaria carriers decline to breed in water impregnated with the gases given off by chopped grain." Domestic animals which graze are included among grass-chopping machines. " Lambourne found that ponds in which cultivated fish were fed on chopped grass and animal excreta were free from malarial carriers." *Haplochilus panchax* is held the best mosquito-larva destroyer, being active, viviparous, a surface lurker; a breeder in salt or fresh water, and so hardy that you can dry it on a towel, leave it for three hours on a table, after which it will swim off at once in water fresh or salt. It is held that the economic and natural method of attacking *Anopheles maculatus*, the hill-stream liver, will prove to be, not by encouragement of undergrowth, not by burying streams, but by impounding water and stocking it with deliberately grass-fed fish.

C. L.

SERGENT (Edm.), SERGENT (Et.) & FOLEY (H.). **L'eau et la fièvre au Maroc. Notes de voyage (janvier 1924).**—*Arch. Inst. Pasteur d'Algérie.* 1924. Sept. Vol. 2. No. 3. pp. 368–390. With 21 text figs. [10 refs.]

A number of photographs illustrate how undisciplined, vegetation-harbouring water, actually or potentially stagnant, has been tamed, civilized and rendered malarially harmless by removal of its vegetation and attention to its banks; and how, by neglect, it lapses again to dangerous savagery. Water without fever can be obtained only by co-operation between engineer and hygienist.

C. L.

RUCHADZE (N.). **(Gagry). [Die Bekämpfung der Malaria in Gagry (Georgien-Kaukasus) im Jahre 1923.] 1924. Suchum.** [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 193–194.]

ROUKHADZÉ (N.). **La campagne antipaludique à Gagry en 1923 et 1924.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 389–392. With 1 chart in text.

In Gagry sanitary care, which included the opening of certain lagoons to the sea and their flushing with water from the electric station, had held malarial incidence at 10 per cent. After the revolution it rose, reaching 90 per cent. in 1922, and its inhabitants fled. Energetic treatment and antilarval measures, especially oiling, led to the following changes between spring and autumn of 1923. Registered cases 61 and 17 per cent., splenic index 73 and 40, parasite index 44 and 17, Ross's index 3·3 and 2·2. In the whole of 1924 ten new cases, an incidence of 2·5 per cent., were recorded. The predominant parasites were *P. malariae* in winter, *P. vivax* in spring, and *P. falciparum* in autumn. Nearly half the quartan cases were ambulatory.

C. L.

ROUBAUD (E.). **Les principes directeurs de la prophylaxie pratique du paludisme.**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 199–214. [9 refs.]

In support of Marchoux [*Sanitation Supplements* 1925. p. 105] Roubaud urges the insufficiency of the ordinary Erench prophylactic procedure. Quinine will only extirpate malaria if all carriers be found and disinfected, an impossible task, he holds. He brings before French readers the striking effects produced by Malcolm WATSON through antilarval measures [*Sanitation Sup.*, 1925, pp. 100–103]. Agricultural improvement, as an anti-malarial measure, is held to act, exclusively and without question, through the provision of an animal screen, rendered adequate by such antilarval measures as keep the anopheline population permanently below the level where they cease to be able to feed their fill on the cattle which they are held to prefer. No fresh facts are adduced.

C. L.

HOULE (E. C.) & HARRIS (H. A.). **Malaria Control by Quinine.**—*Southwestern Med.* 1925. June. Vol. 9. No. 6. pp. 229–232.

Drainage and oiling being inapplicable to 500 miles of railway land, and the dwellings being unfit for screening, quinine sulphate in protective, or rather " abortive," doses of 10 grains on two consecutive nights reduced admissions between 1919 and 1923 from 208 to 67 annually in a force averaging throughout in the neighbourhood of 900. It is pointed out with evident intention that the Italian Government provides quinine at fixed price, at or near cost, and compels its being stocked in shops.

C. L.

i. BOUDREAU. **La quinine est-elle nécessaire aux impaludés?**—*Jl. Méd. de Bordeaux.* 1925. June 25. Vol. 102. No. 12. pp. 515–518.

ii. DHAIRYAM (J.). **The Treatment of Malaria in Pregnant Women.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 165–166.

iii. RAJU (K. V.). **Quinine Plus Alkalies in the Treatment of Malaria.**—*Ibid.* May. Vol. 60. No. 5. pp. 212–213.

iv. BLANCHARD & KERUZORÉ (A.). **Remarque sur le formiate de quinine employé en injection.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 102–104.

v. SALIM (Tewfik). **Stibenyl bei der Malaria.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 183–186.

vi. JACHONTOW (J. E.). **Cuprum Kalium cyanatum bei Malaria.**—*Deut. Med. Woch.* 1925. May 8. Vol. 51. No. 19. p. 785.

i. Regarding LOMBARDI's report (*ante*, p. 50) that quinine should be supplemented by brain extract when given to malarial epileptics, BOUDREAU urges that tincture of iodine in doses increasing to 1,000 drops a day, and continued until normal health is restored, is preferable. He is not interested in the parasitic diagnosis of his cases.

ii. Heavy doses of potassium bromide were combined with intramuscular and oral quinine.

iii. Tests proved favourable to SINTON's quinine and alkali treatment. It is proposed to repeat them with controls.

iv. Of ampoules from two sources, each purporting to contain quinine formate, the one batch was very acid, the other very alkaline. Mixed, they gave a heavy precipitate. It should be stated on ampoules, it is held, whether they contain an acid or a basic solution.

v. In three cases in which stibenyl was combined with quinine crescents persisted for 28, 16 and 27 days, and then disappeared.

vi. It is concluded that the drug gives little hope of successful cure, but that quinine preparations are likely to require activation by copper.

C. L.

i. VALCKE. **Malaria congénitale.**—*Bull. Méd. du Katanga.* 1925. Feb. Vol. 2. No. 1. pp. 3–5. [4 refs.]

ii. DEUSKAR (V. N.). **An Unusual Case of Malaria.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 122–123. With 1 chart in text.

iii. MOLLOW (W.). **Ein Fall von eigenartigen Nagelveränderungen bei Malaria quartana chronica.** [A Curious Alteration in the Nails in Chronic Quartan Malaria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 186–189. With 1 text fig.

iv. ZITO (Egidio). **Del punto doloroso sulla regione splenica dei malarici della sua interpretazione.**—*Riforma Med.* 1925. Mar. 30. Vol. 41. No. 13. pp. 289–291. [13 refs.]

v. KHERA (Krishan Lal). **An Unusual Effect of Malaria upon the Heart.**—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. p. 219.

vi. GONZALO (G. R.). **Hemofilia y anemia paludica.**—*Siglo Médico.* 1925. May 23. Year 72. Vol. 75. No. 3728. pp. 530–531.

vii. ZNAMENSKI (W.). **Zur Klinik der Malariaerkrankungen des Nervensystems.**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. German summary p. 120. [In Russian.]

viii. CAMPBELL (W.). **Notes on a Case of Spontaneous Rupture of the Spleen in Malaria.**—*Jl. Roy. Army Med. Corps.* 1925. June. Vol. 44. No. 6. pp. 457–459.

ix. DE HARTOGH, Jr. (J.). **Geestelijke stoornissen bij malaria tertiana.** [Mental Disturbances in Tertian Malaria.]—*Nederl. Tijdschr. v. Geneesk.* 1925. July 25. Year 69. 2nd Half. No. 4. pp. 482–483. [2 refs.]

i. Plasmodia of unnoted species were found in the two-days-old child. It was born at 8 months of a malarial mother.

ii. Vomiting, acute abdominal pain and urticaria recurring abruptly led to the finding of tertian and subtertian parasites. All disappeared under quinine.

iii. In a microscopically established case of four months' standing the nails showed dark brown lines, 2 or 3 mm. apart, concentric with the margin.

iv. The writer confirms PAGNIELLO's sign. Pain is present in 90 per cent. of malarial cases, absent in all others, when the tip of the finger is drawn along the lower left intercostal spaces.

v. Malarial tachycardia of 210 per minute disappeared under quinine.

vi. A man harbouring "Laveran's parasites," suffering from repeated epistaxis, and judged from his history to have a haemophilic taint, had erythrocytes 2,000,000 per cubic mm., and haemoglobin 40 per cent. Under quinine injections and cacodylate of soda these improved to 3,800,000 and 75.

vii. The summary states that malaria produces changes in the whole peripheral nervous system.

viii. Two cases are noted, one by the editors, of soldiers who died of spontaneous rupture of the spleen in benign tertian malaria, in one while the man was in hospital.

ix. In two cases an acute confusional condition was detected as malarial by blood examination, and disappeared, with the parasites, under quinine.

C. L.

i. FRANÇOIS-DAINVILLE (E.) & GALLAIS (G.). **Sur un cas de paludisme local. Différenciation avec le paludisme autochtone.**—*Rev. Méd. et Hyg. Trop.* 1925. Jan.–Feb. Vol. 17. No. 1. pp. 13–15. [1 ref.]

ii. PITTALUGA (D. G.). **Observaciones sobre el paludismo en Macedonia griega.** [Malaria in Greek Macedonia.]—*Siglo Médico.* 1925. Mar. 21. Year 72. Vol. 75. No. 3719. pp. 293–296.

iii. SIDGWICK (H. C.). **A Case of Laceration of Enlarged Malarial Spleen, with Rupture of the Vessels at the Hilum. Splenectomy. Recovery.**—*Jl. Roy. Army Med. Corps.* 1925. Apr. Vol. 44. No. 4. pp. 288–290. With 1 text fig.

iv. GOYENA (Juan Raúl). **Cirrosis esplenohepática palúdica. (A propósito de un caso de hepatitis esclerosa atrófica, ascitógena, pigmentaria, anictérica, metaesplenomegálica.)**—*Semana Méd.* 1925. Apr. 2. Vol. 32. No. 14. (1629.) pp. 729–732. [10 refs.]

v. WEISS. **Ueber die Blutuntersuchung auf Malariaparasiten. Eine Methode für die Praxis.**—*Med. Klin.* 1925. May 15. Vol. 21. No. 20. pp. 743–744.

vi. IPATJEWA (A.). **Die Blutkörperchenresistenz und die Autohämolyse bei Malaria.**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. German summary p. 120. [In Russian.

vii. ——. **Ueber die blutgefässverengende Stoffen des Blutes bei Malaria.** [A Vaso-Constrictor Substance in Malarial Blood.]—*Ibid.* German summary p. 120. [In Russian.]

viii. ABBATUCCI (S.). **Une nouvelle conception de la prophylaxie antipalustre.**—*Presse Méd.* 1925. July 1. Vol. 33. No. 52. pp. 883–884. [2 refs.]

i. It is proposed to distinguish autochthonous from local malaria, the former spreading and indicating suitable conditions, the latter a single case, not spreading even in the household, and apparently occurring where malaria had existed in previous years.

ii. A second Spanish communication emphasizing the need which the influx of over a million refugees into the Sturma and Vardar valleys imposes to push forward large-scale antimalarial work carried out by co-ordination of the economic and scientific measures at the State's disposal.

iii. In spite of quinine, given for an indeterminable period, after removal of the 520 gm. spleen, an acute paroxysm of benign tertian malaria occurred, cured by more quinine.

iv. A hard shrunken liver with splenomegaly and 9 litres of ascitic fluid are, in the absence of the Wassermann reaction and in the presence of a malarial history, attributed to the latter.

v. The writer describes and advocates diagnosis by the thick drop.

vi. Repeated examinations of 27 cases showed that the erythrocyte resistance was lessened in apyrexia, chronic malaria, and at the height of the attack. Quinine did not affect it. Autohaemolysis was rare.

vii. Perfusion through a rabbit's ear of blood drawn during a malarial attack gave fewer drops per minute than did the blood of a healthy person.

viii. The zoophilic hypothesis of ROUBAUD and an accompanying adaptation of the proboscis are accepted as proved. It is advised that larvae and adults should be attacked at their winter cyclical asthenia.

C. L.

i. HAPKE (F.). **[Die Malariabekämpfung in Emden und Umgebung mit Berücksichtigung der Massnahmen für den Standort Emden.]**—*Veröffentlichungen auf dem Gebiete der Medizinalverwaltung,* Berlin. R. Schoetz. 1924. Vol. 19. No. 1. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 192–193.]

ii. ADELHEIM (R.). **[Verbreitung der Malaria in Lettland.]**—*Latrijas ārstu žurnala.* 1924. g. ; 12. burtu Dec. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. p. 344.]

iii. HATORI (J.). **Malarial Survey of School Children of Taihoku Province, N. Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Feb. No. 239. English summary pp. 2–3. [In Japanese.]

iv. AUSTRALIAN HOOKWORM CAMPAIGN. **Final Report of the Australian Hookworm Campaign. 1st October, 1919, to 30th September, 1924.** [SWEET (W. C.), Director.] **Part II.—Report on a Malaria and Filaria Survey of Australia and on Mosquito Surveys in Queensland, Western Australia and Northern Territory.**—37 pp. With 1 map. September 1, 1922, to August 10, 1924.

v. HIGIER (Heinrich). **Zum Verlauf der perniziösen oder sog. tropischen Hirnmalaria (Meningo-encephalitis haemorrhagica comatosa).**—*Muench. Med. Woch.* 1925. Apr. 3. Vol. 72. No. 14. pp. 559–560. [2 refs.]

vi. DE LAET. **La malaria au Katanga.**—*Bruxelles Méd.* 1925. Mar. 15. Vol. 5. No. 20. pp. cdlxxviii–cdlxxx.

vii. FURUICHI (T.). **Examination of the Kidney Function of Malarial Cases.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1924. Nov. No. 237. English summary pp. 3–4. [In Japanese.]

viii. NELL (Andreas). **Mosquitoes and Malaria.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1925. Jan. Vol. 22. No. 1. pp. 174–175.

i. Tertian malaria, first recognized in and about Emden in 1906 and increasing in 1910, was attributed to work on ditches ; a recrudescence in 1915 to poor drainage. The yearly incidence, including recurrences, from 1918 onwards has been 252, 438, 958, 5,015, 3,955, 793, 638, 420. The 4,107 new attacks, mostly in children, in 1918 are attributable in part to under-nourishment.

ii. Latvia has received a number of malarial Russian immigrants, some of whom showed fever for the first time after their arrival. In Riga, hitherto non-malarial, cases are appearing in the spring, and anti-malarial work is required.

iii. *Plasmodium vivax, P.* "*immaculatum*" and *P. malariae* affected 23,000 children in the autumn of 1921 in the proportion of 72, 68, 10. The highest parasite index was 16·5, the highest splenic index 50. The effect on bodily growth is obvious. Chinese are more affected than Japanese.

iv. Of 9,022 persons examined for malaria 44, and of 14,949 for filariasis 379, were found infected. The anopheline host has not yet been determined.

v. A man who had never left mid-Europe was suddenly attacked with headache, delirium and coma. No malaria parasites were found in the blood after deliberate search. The cerebrospinal fluid showed a positive Wassermann reaction, and, after centrifuging and using the precipitate as a thick drop, rings of " Plasmodium falciforme."

vi. A special report, issued in 1922 by ORENSTEIN of the Johannesburg gold mines, recommended for Katanga a special malarial personnel headed by a medical man or an engineer with special powers, a free hand, and a judgment by results. It remains a report.

vii. The kidney function, tested by phenol sulpho-phthalein, was found normal in uncomplicated malaria.

viii. In 1854-1855 Sir Richard BURTON noted that, according to Somalis, mosquito bites bring on deadly fever, and commented that they confused coincidence with cause.

C. L.

ANIGSTEIN (Ludwik). **Studja zbiorowe komisji Ligi Narodów nad malarja w Europie południowej i wschodniej. Malarja w Państwach Bałkańskich. Studien der Malaria Komission des Völkerbundes. Malaria in den Balkan-Staaten.**—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1925. Jan.–Feb. Vol. 4. No. 1–2. pp. 122–137. German Summary pp. 137–138.

BARBIERI (Antonio). **Concepto de la lucha antipalúdica y su legislación. Consideraciones y procedimientos sugeridos por la observación y estudio en Italia de junio a octubre de 1924.**—*Semana Méd.* 1925. Mar. 5. Year 32. No. 10 (1625). pp. 509–527. With 15 text figs. [5 refs.]

BERING (Fr.). **Die Malariabehandlung im Frühstadium der Syphilis des Zentralnervensystems.**—*Muench. Med. Woch.* 1925. May 1. Vol. 72. No. 18. pp. 719–722.

FOLEY (H.) & BROUARD (M.). **De l'emploi de la quinine à faibles doses comme réducteur du réservoir de virus dans le paludisme des indigènes.**—*C. R. Soc. Biol.* 1925. Mar. 27. Vol. 92. No. 11. pp. 859–861.

—— & ——. **Démonstration de l'efficacité de la quininisation quotidienne, à petites doses, comme réducteur du réservoir de virus dans le paludisme des indigènes.**—*C.R. Acad. Sci.* 1925. Mar. 30. Vol. 180. No. 13. pp. 1076–1078.

GIORDANO (Davide). **Ablazione di grossa milza in un malarico che da alcuni anni era travagliato da febbre.**—*Riforma Med.* 1925. Mar. 30. Vol. 41. No. 13. pp. 296–297.

GROSSMAN (S.). **Wagner-Jauregg Treatment of Dementia Paralytica.**—*Lancet.* 1925. July 4. pp. 16–18. [6 refs.]

IZKOWITSCH. **Ueber die volkstümliche Methoden der Malariabehandlung im Novo-Nikolajewer Gouvernement.**—*Russian Jl. Trop. Med.* 1924. No. 4-5–6. German summary p. 120. [In Russian.]

LOPATINE (G. M.). **A la question de la malaria innée.**—*Rev. Microbiol. et Epidémiol.* Saratov. 1924. Vol. 3. No. 4. In Russian pp. 291–294. [13 refs.] French summary pp. 308–309.

MCALISTER (W. M.). **The Results of the Treatment of General Paralysis by Malaria.**—*Jl. Mental Science.* 1925. Apr. Vol. 71. No. 293. pp. 236–240.

MÜNZER (Franz Theodor) & SINGER (Ernst). **Ueber den Einfluss der Malariabehandlung auf den Hämolysintiter im Serum und Liquor cerebrospinalis von Paralytikern.**—*Med. Klin.* 1925. Feb. 13. Vol. 21. No. 7. (1053). pp. 247–252. [10 refs.]

PAGNIEZ (Ph.). **Le traitement de la paralysie générale par l'inoculation du paludisme.**—*Presse Méd.* 1925. May 30. Vol. 33. No. 43. pp. 717–719. [6 refs.]

PLEHN (A.). **Die chronische Malaria und ihre Behandlung.**—*Therapie der Gegenwart.* 1925. Mar. Vol. 66. No. 3. pp. 105–110.

RAYNAUD (Lucien). **La lutte contre le paludisme en Italie.**—*Rev. d'Hygiène.* 1925. Mar. Vol. 47. No. 3. pp. 193–238. With 6 figs.

RUCHADSE (N.). **Malaria im Dalschen Uschtschelje (Engpass)—Abchasien.**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. German summary p. 120. [In Russian.]

RUDOLF (G. de M.). **The Malarial Treatment of General Paralysis; some Psychological and Physical Observations.**—*Jl. Mental Science.* 1925. Jan. Vol. 71. No. 292. pp. 30–41. [16 refs.]

SKALWEIT (Wolf). **Luetinreaktion und Hämogramm bei Impfmalaria. (Untersuchungen mit Organluetin nach Busson.)**—*Muench. Med. Woch.* 1925. May 8. Vol. 72. No. 19. pp. 762–765. With 3 text figs. [18 refs.]

SPENCER (H. A.). **Prophylaxis in Malaria.**—*Jl. Trop. Med. & Hyg.* 1925. June 1. Vol. 28. No. 11. pp. 207–208.

VALLE (Vittorio). **Il problema della malaria nel Veneto.**—*Ann. di Med. Nav. e Colon.* 1925. Mar.–Apr. Year 31. Vol. 1. No. 3–4. pp. 142–168. [18 refs.]

WIZEL (A.) & PRUSSAK (L.). **Le traitement de la paralysie générale par l'inoculation du paludisme.**—*L'Encéphale.* 1925. Feb. Vol. 20. No. 2. pp. 99–109.

MEDICAL ZOOLOGY.

KESSEL (John F.) & SVENSSON (Ruth). **A Survey of Human Intestinal Protozoa in Peking, China.**—*China Med. Jl.* 1924. Dec. Vol. 38. No. 12. pp. 961–982. [19 refs.]

In this survey, which was continued for six months, faeces-smears from 1,037 individuals, of whom 816 were Chinese (422 hospital patients, and 394 in apparent health) and the rest were resident foreigners, were examined, in 340 cases (268 Chinese) six separate times, in 466 cases (384 Chinese) once—for the entire 1,037 individuals an average of over three separate examinations. All smears found to be positive (by iodine-eosine) were afterwards stained in iron-haematoxylin, "*Councilmania lafleuri*" not being distinguishable from *Entamoeba coli* otherwise. The results of the survey are tabulated in diverse and very particular detail, and there is an interesting synoptical comparison of the big surveys of intestinal protozoa made in all parts of the world since 1917.

Among the Chinese the infestations with intestinal protozoa were as follows, in percentages: *Entamoeba nana*, 40·1; *E. dysenteriae* (=*histolytica*), 29·5; "*Councilmania lafleuri*," 19·2; *E. coli*, 11·7; *Iodamoeba buetschlii*, 13·0; *Giardia intestinalis*, 10·0; *Chilomastix mesnili*, 6·0; *Trichomonas hominis*, 4·5. Among the foreigners in Peking they were as follows: *E. nana*, 26·5; *E. dysenteriae*, 16·5; "Councilmania," 14·5; *E. coli*, 11·6; Iodamoeba, 3·2; Giardia, 3·0; Chilomastix, 10·0; Trichomonas, 2·8.

As regards *E. dysenteriae* (=*histolytica*), the percentage of infestations among Chinese adults was 32·5 and among Chinese children 25·3, the corresponding figures for the foreigners being 25·0 and 1·7; and the percentage among Chinese having intestinal symptoms was 30·4, and among healthy Chinese 23·2, the corresponding figures for the foreigners being 39·2 and 11·3.

A. Alcock.

GELLI (Giuseppe). **Parassiti intestinali e anemie nei bambini.**—*Giorn. di Clin. Med.* 1925. Mar. 20. Vol. 6. No. 4. pp. 121–125.

The author noticed that a considerable number of children of 5–12 years of age attending hospital were anaemic and for some time this anaemia has been denominated "anaemia due to growth and school-life." Further observation revealed an eosinophilia varying between 4 and 23 per cent. He, therefore, undertook a routine examination of the faeces of the patients and found in fully 50 per cent. (1,399 out of 2,750) the ova of worms, most frequently Trichuris and Ascaris. In two cases *E. histolytica* was seen and in two others *Giardia intestinalis*. In one of the latter there was severe anaemia: erythrocytes 2,800,000 per cmm. and haemoglobin 30 per cent. (C.I. 0·54), and it would appear, though not stated in actual words, that the author believes in a causal relation between the parasite and the anaemia.

Treatment with anthelmintics rapidly cured the anaemia, and the author wisely suggests that faecal examination should be carried out in all children with obscure nervous and intestinal conditions, particularly if they are anaemic.

H. Harold Scott.

Prates (Manuel Maximo). **Contribuição para o estudo da parasitologia intestinal humana de Moçambique. Dois anos de análises de fezes no Laboratório Bacteriológico de Lourenço Marques, 1921-1923.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a., 7a. e 8a. Sessões.) 1923. Aug. No. 4. pp. 367–380.

In this paper are given the results of faecal examinations carried out at the Lorenço Marques laboratory during the first two years of its existence. 1,687 specimens were examined and parasites of one kind or another were found in all but 498, or in 70·5 per cent. Of the 1,189 positive cases 617 contained one parasite only, 320 had two, and one as many as seven, namely: Amoeba, Giardia, Trichomonas, Ascaris, Trichuris, Ancylostoma and *Schistosoma mansoni*. The commonest infection was with Trichuris (40·27 per cent.), hookworm next (22·85 per cent.), amoebae (18·55 per cent.), *Sch. mansoni* (4·89 per cent.). It is curious to note that while infections with amoebae and flagellates were more common in patients exhibiting symptoms of intestinal disorder, other parasites were found more often in those apparently healthy, or at least showing no intestinal symptoms.

H. Harold Scott.

Yakimoff (W. L.) & Wassilewsky (W. J.). **Les protozoaires de l'intestin de l'homme pendant les épidémies de Pétrograde (1919–1921).**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 183-191. [5 refs.]

This paper gives the results of the examination of 1,632 stools in Petrograd. The following species were found in percentages: Blastocystis, which the authors incline to regard as pathogenic, 15·7; Vahlkampfia, 3·1; *Entamoeba coli*, 6·1, also thought to be possibly pathogenic; *E. histolytica*, 0·6; *Chilomastix mesnili*, 1·4, causing diarrhoea and sometimes haemorrhagic colitis; *Oecomonas granulata*, 0·2, believed to cause diarrhoea; *Polytoma uvella*, 0·1; Monas sp., 0·1; *Trichomonas hominis*, 0·2; *Prowazekia ninae-kohl-yakinov*, 2·2, causing diarrhoea and dysentery; *Lamblia intestinalis*, 0·1; *Uronema caudatum*, 0·1; *Balantidium coli*, 0·06; besides unidentified amoebae 0·8, and flagellates 1·3.

A. A.

i. Castex (M. R.) & Greenway (D. J.). **Le rôle pathogène du** *Blastocystis hominis*.—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 132–137.

ii. —— & ——. **Le rôle pathogène du** *Chilomastix mesnili*.—*Ibid.* pp. 137–140. [7 refs.]

iii. —— & ——. **Les protozoaires dans l'intoxication intestinale.**—*Ibid.* pp. 177–183. [6 refs.]

i. The chief item of this paper, from Buenos Aires, is the statement regarding pure infestations of *Blastocystis hominis*. The authors have observed 88 such (out of 291 mixed with Protozoa), and they assert that these pure infestations are accompanied by symptoms that persist, despite all attempts at dietetic and therapeutic treatment, until the blastocystis is destroyed either by narsenol or stovarsol Poulenc, or by Iatren 105 Behring. The attributed symptoms are constant and long persistent gastro-intestinal dyspepsia, abdominal pain, flatulence, and alternating constipation and diarrhoea with mucous or glairy and sanguinolent stools, and along with these a variety of nervous and mental troubles due to the intestinal toxaemia.

ii. Out of 118 infestations with *Chilomastix mesnili* the authors have observed 49 that were purely that one parasite, and that those cases of pure infestation were characterized by a train of symptoms that ceased only with the disappearance of that parasite as a result of treatment by thymol, or quinine and creosote, or narsenol or stovarsol Poulenc, or Iatren 105 Behring. The symptoms are chronic gastro-intestinal dyspepsia—pain, flatulence, constipation alternating with diarrhoea and tenesmus—in short permanent indigestion with intolerable periodic exacerbations.

iii. The same authors state that they have observed 614 cases of "entero-toxicosis," in 470 of which intestinal protozoa and blastocystis were present, and they have formed the opinion that these protozoa play just as important part as intestinal bacteria in the production of toxaemia; that they are all and at all times pathogenic.

The first stage in the pathological process is disclosed not by chronic diarrhoea or chronic dysentery, but by an intractable constipation alternating with fits of diarrhoea. It is to this intestinal stasis that most of the gastro-intestinal symptoms [*e.g.*, those mentioned in the two preceding papers] are attributed.

Toxaemic effects of a most diverse kind follow—vertigos, neuralgias, neurasthenias, disturbances of the endocrine equilibrium, particularly hypothyroidism and ovarian troubles—and are exhibited in a great diversity of symptoms, so the authors assert.

The most important of these pathogenic forms is *Blastocystis hominis* [see above]. Next comes *Entamoeba histolytica* when associated with other species; as a pure infection it is less commonly seen in Argentina. *E. histolytica* was observed in 31·7 per cent. of cases; most of the carriers suffered severely from "digestive perturbations." *Chilomastix mesnili* comes next [see above]; then *Giardia intestinalis*, found in 70 cases. *Entamoeba coli* was observed in only 101 cases, and as the sole infestation in only 14 of these.

The drugs upon which the authors particularly rely for the destruction of these intestinal protozoa are stovarsol Poulenc and Iatren 105 Behring. Stovarsol sometimes exacerbates the sympathetic nervous symptoms, and must then be stopped and be re-employed in smaller doses. With the disappearance of the parasites the symptoms abate.

A. A.

HEGNER (Robert W.). **The Control of Intestinal Protozoa by Means of Changes in Diet.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 400–404. [United Fruit Company, Boston, Mass.]

The author's observations on the rarity of intestinal protozoa in carnivorous mammals, and his experiments on freeing rats from their intestinal flagellates by a carnivorous diet have been noticed here (Vol. 21, p. 703).

In the discussion KOFOID stated that carnivorous fishes and insects are not heavily infested with flagellates [but Nepa is a glaring exception to this general statement, and there are several other exceptions among rapacious insects]. He also confirmed (from experiment) the fact that protozoon infestations in rats are affected by modifications of diet. BASS referred to the fact that a carnivorous diet alkalizes the intestinal contents and changes the intestinal flora completely. Nutter had observed increase of flagellates in dysentery patients on milk diet. Deeks had not investigated stools critically, but had frequently observed rapid improvement in cases of chronic diarrhoea when put on a balanced diet, though he could not say whether the protozoa were simultaneously affected, and, indeed, had never incriminated flagellates and ciliates *per se* as causative of diarrhoea. Hegner, in conclusion, explained that his experiments were designed to observe the effect of carnivorous diet upon flagellates, and that he had no certain knowledge as to the pathogenicity or otherwise of the flagellates.

A. A.

Kofoid (Charles A.). **Investigation on Intestinal Protozoa.**—*Carnegie Institution Year Book.* 1923. No. 22. pp. 279–280.

In the course of investigation of amoebiasis associated with a certain type of arthritis deformans a small form of amoebae has been observed which is interpreted as an involution form resulting from a high degree of resistance in supposed bone-marrow infection. In every instance, except one, of Hodgkin's disease examined there was concurrent intestinal amoebiasis—in the one exceptional case only a single specimen [? of stool] was available. From a study of three cases *Pentatrichomonas ardindelteili* is certified as pathogenic (see this *Bulletin*, Vol. 21, p. 773). The work on parasitic amoebic infections of rats and mice has already been noticed in this *Bulletin* (*ante*, p. 13). From a study of Giardia in dogs it is thought probable that the dog may prove to be a carrier to man.

A. A.

Fantham (H. B.). **Some Parasitic Protozoa found in South Africa. VI.**—*S. African Jl. Sci.* 1923. Dec. Vol. 20. pp. 493–500. [3 refs.]

——. **Some Parasitic Protozoa found in South Africa. VII.**—*Ibid.* 1924. Nov. Vol. 21. pp. 435–444. [7 refs.]

These papers are replete with interesting observations of "parasitic" protozoa found in animals of various classes, domesticated and otherwise, in S. Africa, the term "parasitic" being used in a general comprehensive sense and the parasites noticed being conveniently grouped in proper zoological sequence. Among the multitude of species that come under the author's observation here are an Entamoeba (*E. caprae*) found in a goat, one individual having remains of red blood corpuscles in its endoplasm, and an Entamoeba (*E. anatis*) in the faeces of a duck dead of acute enteritis; a Giardia (*G. suricatae*) in the meercat, and another (*G. xenopodis*) in the clawed frog; three several species of Eimeria in goats, pigs, and a fowl; Sarcocystis in sheep, cattle, and pigs; and *Balantidium coli* and *suis* in pigs.

A. A.

Cleveland (L. R.). **Les effets de l'inanition et de l'oxygénation sur la symbiose entre les termites et leurs flagellés intestinaux.**—*Ann. Parasit. Humaine et Comparée.* 1925. Jan. Vol. 3. No. 1. pp. 35–36.

It is now well known that all those termites that feed exclusively on wood harbour a congeries of symbiotic intestinal protozoa, and die slowly if these are experimentally destroyed, though they recover if they are experimentally re-infected with the proper protozoa. The present paper, which does not include any details, contains the information that in the proper congeries of different species of protozoa that occupy the intestine of a given kind of termite some species are more immediately vital to the termite than others, both directly, and also indirectly by their influence on some of the other species. Full details are promised of the experimental evidence for these generalizations and also for the still more general statement that not only the symbiotic protozoa of termites but *all* protozoa are killed (in culture) by oxygenation.

A. A.

CLEVELAND (L. R.). **Toxicity of Oxygen for Protozoa** *in vivo* **and** *in vitro*: **Animals defaunated without Injury.**—*Biol. Bull.* 1925. June. Vol. 48. No. 6. pp. 455–468.

Quoting Paul BERT'S demonstration of the general toxicity of oxygen in excess, the author describes his own experiments on the effect of various oxygen pressures upon termites and their intestinal protozoa. At a pressure of 3·5 atmospheres the protozoa were killed in 30 to 40 minutes, while the termites harbouring them were not killed until 45 hours. It was thus easy to remove all protozoa from termites without injury to the host. Experiments *ad hoc* showed that it was the partial pressure of oxygen, not the mere mechanical pressure, that mattered. The author continued his experiments on the effects of oxygen—upon parasitic protozoa and their hosts (cockroaches, earthworms, frogs and tadpoles, goldfish, salamanders and rats), upon cultures of Trichomonas, and upon free-living protozoa.

The results were such as to permit him to think it " highly probable that all intestinal flagellates and ciliates may be removed from all invertebrates and all cold-blooded vertebrates by oxygenation, without injury to the host." In the experiments with *rats*, however, the rats submitted to 3·5 atmospheres of oxygen did not live more than 5–6 hours and their intestinal protozoa were not killed in that time.

A. A.

KESSEL (John F.). **The Experimental Transfer of Certain Intestinal Protozoa from Man to Monkeys.**—*Proc. Soc. Experim. Biol. & Med.* 1924. Dec. Vol. 22. pp. 206–208. [2 refs.]

A preliminary report of the experimental infestation of monkeys with *Entamoeba coli* and *nana*, *Iodamoeba buetschlii*, *Chilomastix mesnili*, and *Trichomonas hominis*. The monkeys used, which came from southern China, were already harbouring amoebae structurally indistinguishable from *E. histolytica*.

A. A.

KOFOID (Charles Atwood). **Amoeba and Man.**—*Univ. of California Chronicle.* 1923. Apr. & July. pp. 149–170; 291–312. With 6 plates.

This is the Faculty Research Lecture of the University of California for 1922. It is addressed to the whole congregation of the University, and is an admirably clear description of the amoebae of the human intestine, of the circumstances that recently brought them into unusual prominence and induced the author to study them critically, and of the general pathological significance of *Entamoeba histolytica*. It is an excellent account, well illustrated, and set down with as much modesty as cunning.

A. A.

KOFOID (Charles A.) & SWEZY (Olive). **The Cytology of** *Endamoeba gingivalis* **(Gros) Brumpt compared with that of** *E. dysenteriae* **with Special Reference to the Determination of the Amoebas in Bone Marrow in Arthritis Deformans of Ely's Second Type.**—*Univ. California Public Zool.* 1924. June 24. Vol. 26. No. 9. pp. 165–198. With 5 plates & 1 text fig. [40 refs.]

The characters of *Entamoeba gingivalis* are described in considerable detail. The structure of the nucleus of the motile phase (cysts are as yet unknown) is said to be sufficient to distinguish this species from *E. histolytica*; in *E. gingivalis* "the nucleus is proportionally smaller . . . is less regularly spherical, and more often deformed by pressure. The peripheral chromatin is less regularly distributed . . . and is often clumped in unequal masses . . . Some of these masses are connected with the karyosome by spoke radii."

The authors found no evidence of *E. gingivalis* in bone marrow in arthritis deformans of Ely's second type; the species evident was *E. histolytica*.

A. A.

WIGHT (Toynbee). **Notes on** *Councilmania lafleuri* **(Kofoid-Swezy 1921).**—*Proc. Soc. Experim. Biol. & Med.* 1925. May. Vol. 22. pp. 517–522.

The author has examined "many hundreds of stools and carefully stained preparations of specimens containing cysts and free forms" of entamoebae therefrom. He is satisfied of the existence of *free amoebae* possessing clear blade-like pseudopodia, and otherwise conforming well enough with KOFOID's Councilmania notion; but of thousands of these amoebae observed by him in the course of some years he has not found one that contained a red blood corpuscle: they are scavengers like ordinary *E. coli*. Having followed the *cysts* of these "Councilmania" amoebae, he finds (1) that there is no special difficulty in staining them; (2) that it is easy, by suitable staining, to demonstrate a ridge which, however, is part of the cyst wall—apparently a fold of the wall—and can be decoloured entirely, leaving the chromidial bodies deeply stained; and (3) that the "bud" and "pore" of this *non*-chromophile ridge cannot be detected in fresh saline smears, though after treatment with hot mercuric solution (Schaudinn) "a very large proportion of the cysts will now show protruding 'buds'—the 'pore' varying from a minute aperture to a frankly ragged tear in the cyst wall." The plain inference that these "buds" are artificial is corroborated by the impossibility of finding any detached amoebules in stools from which stained exhibits of budding cysts can easily be made, and also by the reflection that budding of amoebules in the bowel of the host is a sort of fault to nature and to reason.

The author's conclusions are that there are at least two types of *E. coli*. One of them has clear pseudopodia, is sometimes exceptionally motile, and seems to have a tendency to form cysts that are easily burst in hot Schaudinn solution—and answers perfectly to the description of Councilmania given by KOFOID and SWEZY. The other is the ordinary sluggish type; if a sufficient number of its cysts be concentrated and fixed in hot Schaudinn solution some of them probably will show the peculiarities to which Kofoid & Swezy have given the name "Councilmania." If budding be the distinction, the "organisms that we have been accustomed to include under the term *E. coli* are potential Councilmania." "If budding be a natural process *E. coli* must be the rarest of intestinal inhabitants and Councilmania the commonest."

A. A.

Kessel (John F.). **The Eosin-Criterion of the Viability of Protozoan Cysts as applied to Cysts of** *Hartmannella hyalina* **treated with Chlorin-Water.**—*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 153–157. [5 refs.]

With reference to the criterion of viability of Protozoan cysts by the iodine-eosin stain, the author concludes that red cysts are incapable of development; that all green cysts are not viable, since a percentage of them may, after an interval, stain red or show plasmolysis; and that this interval should be considered in future applications of the eosin test.

A. A.

Ganguli (P.). **Is** *Trichomonas hominis* **Pathogenic?**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. p. 160.

The author upholds the opinion that *Trichomonas hominis* is pathogenetic. The arguments that he offers are (1) that in 36 out of 43 cases of diarrhoea or dysentery in Eastern Bengal this organism was present; (2) that in 3 of the dysentery cases no dysentery bacilli could be discovered by plating; (3) that in 6 of the diarrhoea cases Trichomonads with ingested red blood cells were found, although no blood cells could be found in the stools; (4) that red blood cells were not found within Trichomonads from any of the dysentery stools, in which blood cells were present; and (5) that Trichomonas can be eradicated by big doses of oil of turpentine emulsified with castor oil.

A. A.

Dastidar (S. K. Ghosh). **Trichomonas Infection in the Urine.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 160–161.

In the course of about a thousand routine examinations of urine the author has observed Trichomonas in four cases—3 males, 1 female. In all four cases the urine was acid. In the three male cases pus cells were also present. In two of the male cases both Trichomonas and pus cells disappeared spontaneously. The author concludes that Trichomonas may cause a slight urethritis.

A. A.

Hegner (Robert W.). *Trichomonas vaginalis* **Donné.**—*Amer. Jl. Hyg.* 1925. May. Vol. 5. No. 3. pp. 302–308. With 3 text figs. [7 refs.]

"Vaginal mucus obtained from 20 women in the United Fruit Company hospital at Tela, Honduras, and from 12 women in the United Fruit Company hospital at Port Limon, Costa Rica, was positive for *Trichomonas vaginalis* in 50 per cent. of the cases at each hospital." The organism is carefully described and figured.

A. A.

HEGNER (Robert W.). **Intestinal Flagellates in Tropical America.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 239–245. [7 refs.]

The author notes a high incidence of infestation with *Trichomonas hominis* and *Chilomastix mesnili* in the stools examined in United Fruit Company's hospitals at Tela and Port Limon, and thinks it may be explained by the hot and moist climate, the insanitary habits of the natives, and the vegetable complexion of the diet.

A. A.

BOZZOLO (G.) & GRAZIADEI (G.). **[Su un caso di diarrea cronica con presenza di "** *Tetramitus mesnili.*"]—*Minerva Medica.* 1922. Nov. 15. No. 22. [Summarized in *Bull. Inst. Pasteur.* 1925. July 15. Vol. 23. No. 13. p. 568.]

The case, according to the summary, was in a man of 33 years, a sufferer for 7 years from diarrhoea that resisted all treatment. *Chilomastix mesnili* was found in abundance in the faeces and, in the absence of any evidence of tuberculosis or dysentery bacilli, was decided to be the cause. The treatment finally adopted was removal of the gall-bladder.

A. A.

i. PONS (R.). **Infection secondaire de l'utérus** *post partum* **par** *Chilomastix Mesnili.*—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 258–259.

ii. HEGNER (Robert W.). **Excystation in** *Giardia lamblia* **from Man.**—*Amer. Jl. Hyg.* 1925. May. Vol. 5. No. 3. pp. 250–257. With 12 text figs. [1 ref.]

iii. LAVIER (G.). **Deux espèces de** *Giardia* **du rat d'égout parisien** (*Epimys norvegicus*).—*Ann. Parasit. Humaine et Comparée.* 1924. Apr. Vol. 2. No. 2. pp. 161–168. With 2 text figs. [6 refs.]

iv. NIESCHULZ (Otto) & KRIJGSMAN (B. J.). **Ueber** *Giardia simoni* **Lavier.**—*Arch. f. Protistenk.* 1925. Vol. 52. No. 1. pp. 166–169. With 2 charts & 2 text figs. [3 refs.]

v. THOMSON (John Gordon). **A** *Giardia* **parasitic in a Bursate Nematode living in the Viscacha.**—*Protozoology* (Supplement to the *Jl. Helminthology*). 1925. May. No. 1. pp. 1–6. With 3 text figs. [21 refs.]

i. *Chilomastix mesnili* has been found in 0·3 per cent. of stools examined in the Saigon laboratory ; but its spread from the intestine to the genital tract, as observed in this case, is worthy of notice.

ii. "It was found possible to separate the giardias that occurred in this stool into six types," the stool being one in which excystment was adjudged to be taking place. These six types are described and figured.

iii. Examination of 301 rats from the drains of Paris, 38 *rattus* and 263 *norvegicus*, disclosed Giardia in 6 of the latter. In 3 instances the species present was *G. muris*, in the other three it was a species structurally identical with *G. intestinalis* from man. The author therefore arrives by a circular route at the conclusion that it is a new species and styles it *G. Simoni.*

iv. These observers in the Netherlands (Utrecht) have found *Giardia simoni* Lavier in *Mus norvegicus* and in a white rat. They here make and graphically represent some comparisons between it and *G. muris* (Grassi) and they state that the parabasal body in *G. simoni* does not agree with the description of it given by its sponsor. A figure constructed from two specimens of *G. simoni* observed by them is compared with a reproduction of LAVIER's figure of the species.

v. Nematode worms (Viannella sp.) taken from the intestine of two dead specimens of a Viscacha in the London Zoo were found to be very heavily infested with a species of Giardia "morphologically indistinguishable" from *Giardia viscaciae* Lavier. A bibliography of Giardia is annexed.

A. A.

COVENTRY (Frances A.). **The Reaction Product which inhibits Reproduction of the Trypanosomes in Infections with** *Trypanosoma lewisi*, **with Special Reference to its Changes in Titer throughout the Course of the Infection.**—*Amer. Jl. Hyg.* 1925. Mar. Vol. 5. No. 2. pp. 127–144. With 2 figs. [5 refs.]

The author adopts the belief that the natural resistance of the rat to its trypanosome is due to the development of a material product in the rat's blood, and the following summary of the conclusions from her experiments here recorded looks very much like an expression of familiar (yet abstruse) phenomena in materialistic terms:—

"The presence of the reaction product which inhibits reproduction of the trypanosomes could not be demonstrated in the blood of infected rats on the 5th day of infection. The reaction product must be present before the 5th day, because the rate of reproduction is declining by that time. There is a sudden, very great, increase in the titer of the reaction product between the 5th and 6th days of the infection. There is a gradual increase in the titer of the reaction product between the 7th and, approximately, the 35th days of the infection. There appears to be a decrease in the titer of the reaction product from about the 35th day to the end of the infection."

It may be explained that the titre of a serum was determined by using serum from rats at given intervals of the infection and injecting it, together with trypanosomes, in varying doses, into the veins of the tail of young rats. The effects were observed by successive timed examinations of blood films.

A. A.

BRUYNOGHE (R.) & DUBOIS (A.). **Action du radium sur les trypanosomes,** *in vitro*.—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 213–215. [3 refs.]

This is a preliminary account of a study to be published hereafter *in extenso*. Exposing trypanosomes (*gambiense* and *brucei*), *in vitro*, to emanations of radium, under varying conditions of time and circumstance, the authors found it possible to deprive them of their virulence without depriving them of their mobility. They conclude that the alpha and beta rays act directly upon the trypanosomes and particularly upon the elements that preside over fission.

A. A.

BRUYNOGHE (R.) & DUBOIS (A.). **Action de dépôts radio-actifs sur l'infection à** *Trypanosoma ugandae* **du lapin.**—*C.R. Soc. Biol.* 1925. Mar. 13. Vol. 92. No. 9. pp. 752–753.

Document of an experiment of which the conclusion is that radio-active elements injected intravenâ into a rabbit have no influence on the evolution of an infection with *Trypanosoma ugandae*.

A. A.

MUIJZERT (P. C.). **Het vermogen van Trypanosomen om onbeleedigde conjunctiva en vaginaalslijmvlies te passeeren.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Dec. 30. Vol. 11. No. 1. pp. 33–43. English summary p. 44. [26 refs.]

The experiments here summarized show that trypanosomes can penetrate the normal uninjured conjunctiva and vaginal mucous membrane and produce a general infection of the animal, provided a large number of trypanosomes be applied (and their application be repeated if necessary). The trypanosomes used were *T. brucei, equiperdum, evansi, gambiense, rhodesiense* and *venezuelense*, and the subjects of experiment 20 guineapigs (10 for each route), all of which took a general infection.

A. A.

BRUMPT (E.). **Guérison d'infections mortelles de grenouilles dues au** *Trypanosome Inopinatum* **par le " Bayer 205." Etudes de diverses questions générales concernant la prophylaxie de la maladie du sommeil.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 4. 6a, 7a, e 8a Sessões.) 1923. Aug. No. 4. pp. 131–139. [1 ref]

The author emphasizes the convenience of *Trypanosoma inopinatum*, mortal to the frog, for the complete study of the effects of a trypanocide on an infection with a pathogenic trypanosome through both the vertebrate and the invertebrate host (in this case a leech).

His own experiments with " Bayer 205 " show that although this drug does not kill the trypanosome in culture, or *in vitro*, or in the living frog's blood, and although it does not inhibit the evolution of the trypanosome in leeches that have ingested blood of frogs under treatment with it, it is yet slowly, but decidedly, efficacious in the treatment of frogs suffering from the infection. It must therefore be assumed that the drug acts indirectly, either by strengthening the natural defences of the frog, or by suffering some modification in the living tissue of the frog.

A. A.

SOULE (Malcolm Herman). **Microbic Respiration. III. Respiration of** *Trypanosoma lewisi* **and** *Leishmania tropica.*—*Jl. Infect. Dis.* 1925. Mar. Vol. 36. No. 3. pp. 245–308. With 2 charts in text. [23 refs.]

Both parasites require free oxygen for growth and multiplication. When grown in tubes having a capacity of about 100 cc. of air, *Leishmania tropica* consumed all of the O in about 144 hours, and *Trypanosoma lewisi* in about twice that time. *T. lewisi* was more sensitive to increasing partial pressures of O than *L. tropica*. A concentration of 50 per cent. O was the critical point for the growth of *L. tropica*; it was able to consume all this, and returned nearly 34 per cent. of CO_2. CO_2 was not essential to the life of the organisms. CO_2 in concentrations greater than 20 per cent. was toxic for *T. lewisi* even when excess of O was present; *L. tropica* was less sensitive. The value of the respiratory quotient increased with the duration of the experiment, and this was supposed to indicate secondary changes in the medium.

It has been the impression among workers that the composition and reaction of the culture medium is all that matters; the author appears to be the first to show that the gaseous environment must also be considered.

A. A.

TANABE (Misao). [**Some Experimental Studies on Trypanosomes.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. June. Nos. 339/340. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. pp. 301–302.]

Trypanosomes of the *gambiense* species injected into mice kept starved for 3 or 4 days did not multiply in them so vigorously, but were just as quickly fatal as to the control animal. 5 of 7 mice infected with *T. gambiense* and 3 of 4 infected with *T. equiperdum* gave a positive Wassermann reaction and also a positive luetic precipitin test. The serum of a rabbit that had received an injection of killed *T. gambiense*, though it did not give a positive WR, yet contained complement fixative and imparted a certain degree of immunity.

A. A.

TAOKA (Kiyowo) & TANABE (Misao). [**Serological Diagnosis of Experimental Protozoan Diseases. Communication I. Serological Test of Experimental Trypanosomiasis.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. Nov. No. 345. [Summarized in *Japan Med. World.* 1925. May 15. Vol. 5. No. 5. pp. 132–133.]

"The author observed that in several weeks from the trypanosome infection there developed a power to act positively for Wassermann and precipitation reactions. Even when the normal serum should have a positive Wassermann reaction it never acted positively for the precipitation. As soon as the serum of the trypanosomiasis rabbit becomes positive to Wassermann there developed oedema in the mucous membrane of the eyelids, mouth, and nose. A kind of reactive substance was, then, seen to have developed in the serum, and it was found to be completely equal to the luetic reactive substance. In saline organ-extracts of the rabbit suffering from trypanosomiasis no reactive substance could be proved."

A. A.

IWANOW (E.). **Le sort du** *Trypanosoma equiperdum* **dans la cavité générale de** *Galleria mellonella.*—*C.R. Soc. Biol.* 1925. Feb. 13. Vol. 92. No. 5. pp. 345–347. [2 refs.]

The author finds it quite easy to inoculate caterpillars of *Galleria mellonella* (the bee moth) with *Trypanosoma equiperdum* if the operation is aseptic, and he finds that at room temperature the trypanosomes proliferate in the caterpillars' blood and can still be observed there at the end of 9 days, the blood remaining infective for mice for 4 days longer. At a temperature of 5° C. the trypanosomes maintain their vitality even better. He suggests that bee-moth caterpillars might be used in place of guineapigs and mice for the laboratory ménage of trypanosomes.

A. A.

SIMON (Clément), FLANDIN (Ch.), SÉGUIN & LECOQ.—**Action,** *in vitro,* **des estraits pancréatiques sur le trypanosome du Nagàna et le** *Spirochaeta Gallinarum.*—*C.R. Acad. Sci.* 1925. May 18. Vol. 180. No. 20. pp. 1541–1542.

Certain organic extracts can act upon trypanosomes without any help from associated arsenic. An insulin prepared by extracting pancreas in acid alcohol and subsequent purification by picrate kills *T. brucei* (and also *Spirochaeta gallinarum*), *in vitro*, in 30 to 35 minutes. The effect is not due to acidity of the preparation, and there is no lysis of the organism even with a concentrated solution.

A. A.

ERBER (Berthe). **Influence de la peptone sur la phagocytose des trypanosomes dans la lymphe de la grenouille.**—*C.R. Soc. Biol.* 1925. May 29. Vol. 92. No. 18. pp. 1422–1423. [5 refs.]

Experiments here reported consisted in injecting mouse-blood rich in trypanosomes (*T. brucei*) into the dorsal lymph-sac of frogs that had received an injection of peptone 18 to 24 hours previously, in comparison with frogs not treated with peptone. Phagocytosis was delayed as consequence of treatment with peptone.

A. A.

SHORTT (H. E.). **Note on** *Bodo phlebotomi* (*Herpetomonas phlebotomi*) **(Mackie 1914) : A Reconsideration of its Generic Position.**—*Indian Jl. Med. Res.* 1925. July. Vol. 13. No. 1. pp. 141–142. With 1 plate. [1 ref.]

The discovery that the kala azar parasite develops into the flagellar form in the gut of *Phlebotomus argentipes* makes it imperative to avoid confusion between that form and other—presumably unimportant—flagellates associated with Phlebotomus. The author therefore has critically examined the original specimens of the flagellate discovered by MACKIE in *Phlebotomus minutus* and described by MACKIE as *Herpetomonas phlebotomi* [this *Bulletin*, Vol. 5, p. 282], and he gives his reasons for deciding that they are congeneric with Bodo rather than Herpetomonas.

A. A.

FANTHAM (H. W.). **Blood-Smear showing Experimental Infection with Herpetomonas.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.) 1925. June. Vol. 18. No. 8. p. 55.

Remarks upon a smear of blood of a rat on the 35th day after the animal had been inoculated, intraperitoneally, with a saline emulsion of the gut-contents of a house-fly naturally infected with *Herpetomonas muscae-domesticae*; the rat had been kept in an insect-proof cage ever since it had been able to feed itself and the blood-smear contained flagellates. A few young herpetomonads had been found in rat's blood on the 9th day after inoculation; none was found after the 35th day from inoculation though the blood was examined daily up to the 315th day.

A. A.

REICHENOW (Eduard). **Ueber das Vorkommen von zwei Coccidienarten der Gattung Isospora beim Menschen.** [On the Occurrence of Two Species of Coccidia of the Genus *Isospora* in Man.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Apr. 1. Vol. 29. No. 4. pp. 172–178. With 3 text figs. [9 refs.]

In the fresh stool of a sailor suffering from amoebic dysentery, the author found, on a single occasion, two bodies which he identifies as spores of an *Isospora*. They were oval, measuring $16\mu \times 10{\cdot}5\mu$, and each contained 4 sporozoites and some residual inclusions. The oocyst supposed to contain them was not seen—as they lay in " a pretty thick mass of faeces "—and was therefore not measured.

Although these spores are not significantly different in any way from those of the now well-known species of *Isospora* occurring in man (*I. hominis* (Rivolta) Dobell), the author considers that they belong to a different species because they were passed in a fully developed state: and after some argumentation he reaches the conclusion that he is the first to rediscover the species of *Isospora* observed by KJELLBERG in 1860, and believes that he has been able to verify the hypothesis of WENYON [see this *Bulletin*, Vol. 20, p. 785] that two species of *Isospora* occur in man—not one, as other workers have supposed.

Clifford Dobell.

BARTO (A. J.) & SCHIJVESCHUURDER (W.). **Een geval van Coccidiosis** (*Isospora hominis*).—*Geneesk. Tijdschr. v. Nederl. Indië.* 1925. Vol. 65. No. 1. pp. 36–40. With 1 plate.

A European woman, 27 years of age, 2 years resident in the tropics, suffered from painful, slimy diarrhoea. In the stools *Isospora hominis* was found and no other intestinal parasites could be detected. Under the treatment, consisting of a cathartic, followed by bismuth and bolus alba and light digestible diet, the symptoms slowly subsided and the cysts disappeared gradually.

W. J. Bais.

SINTON (J. A.). **Bodies resembling Haemogregarines found in Smears of Human Blood.**—*Indian Jl. Med. Res.* 1925. July. Vol. 13. No. 1. pp. 29–31. With 12 figs. on 1 plate. [2 refs.]

Referring to WENYON'S paper on Haemogregarines in Man (this *Bulletin*, Vol. 20, p. 527) the present author describes critically, and figures, bodies having a remarkable resemblance to haemogregarines encountered by him in 10 out of 50 slides under examination for malaria parasites at Lahore. When the matter was investigated it was discovered that the fresh supply of distilled water had run out and some of the residue of a stock some months old produced. The author considers that this find strongly supports WENYON'S opinion of the nature of the reputed "haemogregarines" of human blood.

A. A.

i. YAKIMOFF (W. L.) & MILLER (G. A.). **Les protozoaires de l'intestin de l'homme en dehors de l'organisme de l'homme. L'examen de l'intestin des grenouilles de Pétrograde.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 306–309. [3 refs.]

ii. ——, WASSILEWSKY (W. J.) & ZWIETKOFF (N. A.). **Sur la culture des protozoaires de l'intestin.**—*Ibid.* Mar. 11. Vol. 18. No. 3. pp. 260–261.

——, —— & ——. **Influence du chlorure de sodium sur les cultures de protozoaires.**—*Ibid.* pp. 261–265.

iii. KESSEL (John F.). **The Distinguishing Characteristics of the Intestinal Protozoa of Man. A Syllabus for Clinicians.**—*China Med. Jl.* 1925. Feb. Vol. 39. No. 2. pp. 85–122. With 114 figs. on 8 plates. [20 refs.]

v. JOYEUX (Ch.). **Pénétration des parasites par la voie cutanée.**—*Ann. Dermat. et Syph.* 1924. May. 6th Ser. Vol. 5. No. 5. pp. 272–289. With 9 text figs.

v. FRANÇA (Carlos). **Notes parasitologiques sur l'Angola.**—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 255-262. With 3 text figs. [11 refs.]

vi. STILES (C. W.) & HASSALL (Albert). **Key-Catalogue of the Protozoa reported for Man.**—*Treasury Dept. U.S. Public Health Service. Hyg. Lab. Bull. No. 140.* 1925. May. 67 pp.

vii. ANDERSON (Ch.). **Note concernant les recherches pratiquées sur le latex de quelques Euphorbiacées de Tunisie.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 257-258. [1 ref.]

viii. DE JONG (D. A.). **Over Balantidium-infectie.**—*Tijdschr. v. Vergelijk. Geneesk. enz.* Leyden. 1925. Mar. 11. Vol. 11. No. 2. pp. 105-110. With 3 figs. [8 refs.] English summary p. 110.

i. An uncritical paper tabulating the familiar Protozoa that live in the intestine of the common frog and toad. Some details are given of three spirochaetes from the same source, all named as " new species."

ii. (1) For the cultivation of certain intestinal [and coprozoic] protozoa, but not such forms as Giardia, Chilomastix, Trichomonas, etc., the authors use a medium of 10 per cent. bouillon, 90 per cent. water, and 1·2 gm. gelatin, to which they attach the name Frosch-Schardinger.

(2) The authors find that certain protozoa do better in a medium that is physiologically saline.

iii. A critical epitome of the facts of this subject and of the laboratory methods of getting at them.

iv. A résumé of the well-known parasites that enter the human body through the skin.

v. Description of 2 species of Trypanosoma and 2 species of Haemogregarina (of which one, *H. froilanoi*, is new) from Angola toads (*Bufo regularis*).

vi. As is stated in the Introduction, this paper represents " Part I of Stiles and Hassall's Host Catalogue, Index Catalogue of Medical and Veterinary Zoology."

vii. Since 1922 the author has investigated the latex of 7 species of Euphorbia in Tunis and has examined several species of bugs. He has several times inoculated mice, rats, cats, or dogs with Euphorbia latex, but has not observed any result.

viii. " The question of identity of *Balantidium coli* in man and pig is treated in this article."

A. A.

REVIEWS AND NOTICES.

ELLIS (Henry A.) [B.A., M.B., Ch.B.]. **An Explanation of Hydrogen Ion Concentration. The Capillator Method for the Determination of Acidity and Alkalinity in General Practice. Brochure II.** 20 pp. With 2 text figs. 1925. London: H. K. Lewis & Co., Ltd. [Price 1s. net.]

The author feels that the descriptions, in "text-books and papers," of the principle underlying the methods employed for the determination of hydrogen-ion concentration are too complicated to be readily appreciated by "those engaged in general practice," and this pamphlet is an attempt to deal with the subject in simpler language, avoiding, where possible, the use of technical terms. It covers all the ground of interest to those for whom it is designed, but it seems that the author has in some degree underrated the intelligence of his readers, and it cannot be said that his rendering of the subject is as instructive as some of the "complicated" versions of which he complains. Many of the descriptions are long and involved, and frequent reiteration detracts from the interest of the subject without aiding in its elucidation.

The Capillator, a piece of apparatus designed for estimating the reaction of small quantities of liquid, in connexion with the use of which this pamphlet is published, is figured in two illustrations, but the only description of it to be found in the text is, "a series of these colour indicators in capillary tubes, put up in a case together with the requisite number of suitable dyes." A description of the application of the method is not given, but apparently this is contained in a separate pamphlet issued with the apparatus.

J. T. Duncan.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 22.] 1925. [No. 11.

LEPROSY.

DE SOUZA-ARAUJO (H. C.). **The Leprosy Problem in Brazil.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 219-228.

The author states that 10,000 lepers are known in Brazil, but he estimates the true number at 24,000. No active steps to deal with the problem were taken until 1921, when a Leprosy Board was appointed, which in 1923 issued an excellent series of regulations. He agrees with former writers in finding the States of Para, Minas Geraes and S. Paulo to be most infected, and gives figures and data regarding other States. The construction of ten large agricultural leper colonies is to be gradually carried out, but with the present Government grants it will require 15 years to complete them. The regulations provide for compulsory notification and segregation, and the immediate separation of children born to lepers; the isolation at home of uninfective nerve lepers is permitted, and the return of all alien lepers to their native countries is provided for; all excellent measures. Segregated lepers may be treated by their own physicians at their own expense. Cohabiting of married lepers in the leprosaria is permitted.

Leonard Rogers.

LIMA (Atualpa Barboza). **A lepra no Ceará.**—*Arch. Brasileiros de Med.* 1925. Mar. Vol. 15. No. 3. pp. 107–116. With 2 figs.

The author undertook a very thorough investigation into the question of the prevalence of leprosy in Ceará. He examined bacterially each patient and a large number of suspects. As a result he found 428 cases in all, of whom by far the largest numbers, 151, were in Fortaleza, the next in order being Jaquariba-Mirim with 36 and Sobral with 27. There are two Dispensaries for treatment, one at Fortaleza and one at Sobral. Chaulmoogra oil by injection is employed, but, since the patients are not kept in hospital, the treatment is not as thorough and prolonged as is desirable. The results, in consequence, are far from satisfactory. [Details are not given.]

H. Harold Scott.

FOWLER (Henry). **A Survey of Leprosy in China.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 584–590.

The author has collected all the available information by means of questionnaires and extensive travel, but finds it impossible to form even an approximate estimate of the number of lepers in the different provinces. It is clear that the hot southerly coast Provinces of Kwangtung and Fukien suffer most, and the neighbouring Yunan and Kwangsi, as well as the more northerly coast Provinces of Kiangsu and Shantung, and all the Yangtse central Provinces except Anhwei are widely infected ; extensive areas in the north and west are reported to be practically free from indigenous cases, including Chihli and Manchuria, and probably Mongolia and Sinkiang. With the exception of the southern Kwangtung, Kweichow and Fukien Provinces no attempt is made to isolate even in villages the begging lepers, and the 20 leper settlements or asylums in these Provinces are all provided by Christian missions, who are trying to extend this work in Shantung and Yunan, for it is considered that " modern scientific methods, coupled with a form of voluntary segregation on the part of the lepers themselves, happily give good prospects of changing the entire outlook of China's lepers and ultimately ridding China of leprosy."

L. R.

CALLENDER (G. R.). **An Epidemiological Study in Leprosy.**—*Philippine Jl. Sci.* 1925. May. Vol. 27. No. 1. pp. 9–18. With 1 text fig. [2 refs.]

The author has carried out some inquiries on the conditions influencing the infection of leprosy, which are in close agreement with those of previous workers. Contact with another leper is admitted in 36·9 per cent., the patients often concealing the information to save relatives being segregated; relative and non-relative contacts were noted in nearly equal numbers ; children and young people were most attacked, the age on the appearance of the first symptoms being below 20 years in 38·7 per cent., and men being more attacked than women. He found the average time between the first symptom and diagnosis to be 2·47 years, and that the first symptom in 78·2 per cent. was the appearance of anaesthesia; the location of the first lesion was the exposed parts of the lower extremities in 81·5 per cent., 47 per cent. being on the feet, and if other exposed parts are added, such as the head, face and neck, the proportion was no less than 94 per cent., pointing to infection through the contact of leprous material with solutions of continuity of the skin surface. Approximately 5,000 lepers in the Philippines are segregated, and probably an equal number of cases are free, now mostly early ones.

L. R.

JASON (Jennie M.). **The Leper Colony of the Virgin Islands of the United States.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 615–617.

A leper colony was opened in 1908 and was taken over by the U.S. Government with the three Danish Islands in 1917. It now has two physicians and a nurse for 70 lepers, the patients being surrounded by a wire fence and guarded, but work and modern treatment is provided.

L. R.

RAYNAUD (Lucien). **La lèpre en Algérie.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 623–626. [7 refs.]

The writer states that in 1897, 58 lepers were known in Algeria, and the number is now estimated at about 150, some 50 being Musulmans and 62 Spaniards, most of whom have long been settled in the country. The only prophylactic measure enforced is the exclusion of foreign lepers. The patients are treated in skin clinics at the hospitals.

L. R.

COLOMBANI. **Note sur la prophylaxie de la lèpre au Maroc.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 629–631.

In Morocco there are now 302 known lepers, about half in the Fez region. The disease does not appear to be increasing, although little is being done to check it. The author advises compulsory notification and the formation of several agricultural colonies for the isolation of the lepers and their families, together with complete isolation of infective cases and efficient treatment.

L. R.

ABBATUCCI (S.). **La médecine aux colonies françaises : prophylaxie de la lèpre en Indochine.**—*Presse Méd.* 1925. May 30. Vol. 33. No. 43. p. 723.

A recent census showed 5,813 lepers in Indochina, 4,454 interned in leper asylums or segregation villages, 283 under surveillance, 956 not interned and 301 awaiting internment. Ethel esters from *Hydnocarpus anthelmintica* prepared locally are being used, and are considered superior to imported preparations ; the results are satisfactory. The patients willingly continue the injections in the institutions, but free lepers often failed to return for them, so the authorities consider compulsory isolation is still necessary ; uninfective cases may be treated as out-patients. The sexes are segregated in the leprosaria, but not in the villages, where the separation of healthy infants born to the lepers is very difficult, since artificial feeding leads to almost certain death from gastro-enteritis.

L. R.

NOËL. **Prophylaxie de la lèpre dans les établissements français dans l'Inde.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 104–115.

This paper deals with leprosy in Pondichery, where efforts have been made to adopt the more humanitarian methods advised by the Strasbourg Leprosy Conference of 1923. They include modern treatment, numbering and registering the lepers, hygienic education, the appointment of a special inspecting officer to look after them, and medical officers, with equipment to treat them at the colonial hospitals on the lines advised by E. MUIR, while in future the leper asylums are to be called prophylactic hospitals.

L. R.

GRAM (H. M.). **Quelques indications sur la lèpre en Norvège.**—*Bull. Office Internat. d' Hyg. Publique.* 1925. June. Vol. 17. No. 6. p. 632.

The well-known prophylactic measures in Norway are briefly mentioned, and the present numbers are reported to be 78 in the leprosaria and 35 in their homes, or not more than 1 to 20,000 population, against nearly 2 per mille in 1857.

L. R.

GUILLÉN (Mauro). **La lepra en España.**—*Siglo Medico.* 1925. May 30. Year 72. Vol. 75. No. 3729. pp. 553–554.

Leprosy is endemic in the Canary Islands, and there are three main foci in Galicia, Andalucia and Levante. In the last-named the disease is present in the Provinces of Valencia, Alicante, and on from Tarragona to Barcelona. There is a leprosarium in Fontilles which has been of great service since its inauguration in 1909. The author holds with compulsory segregation of all lepers without exception in establishments commensurate as far as possible with the social status of the patients. At all institutions for dealing with the disease, apart from clinical and operation rooms, a laboratory is essential to ensure early diagnosis of cases, as it is largely, if not solely, in early cases that actual cure can be brought about.

H. Harold Scott.

BAUJEAN. **Prophylaxie et traitement de la lèpre à la Martinique.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 115–123. [1 ref.]

This small French island colony has long had a leper asylum on the tiny island Desirade, which is the terror of the patients. In accordance with recent advance, as elsewhere, this place is now being reserved for mutilated and infirm lepers, who are no longer amenable to treatment; the open infectious cases discharging lepra bacilli are treated in special isolation wards at the different hospitals until no longer contagious, while the uninfectious cases, not discharging bacilli from nasal or skin lesions, will be dealt with as hospital out-patients or under their own doctors, which will enable the early cases to come forward without fear of being sent to Desirade. These humanitarian measures may confidently be expected materially to reduce the incidence of the disease after some years. Ethel ester chaulmoogrates and other recent treatments are being used with good results.

L. R.

PUBLIC HEALTH REPORTS. 1925. May 8. Vol. 40. No. 19. pp. 928–930.—**Leprosy in the Philippines.**

This is a brief account of the work at Culion, to which an average of 1,000 lepers have been sent annually during the last 19 years. At first glance this does not appear to support the value of the measure, but the objection is answered by the fact that whereas at first the great majority of the lepers were advanced maimed cases, in recent years an ever-increasing number of early cases are admitted: "Incontestable evidence that segregation is becoming effective and that a few more years of vigorous enforcement will stem the tide." About 5,000 remain at Culion, while a few hundred have been discharged in recent years on parole, nearly all since the improved treatments were given. The total death rate of the colony compares favourably with the average Filipino town, and " the results of improved methods of treatment seem to warrant the opinion that many cases of leprosy are curable ; " this has induced new hope in the lepers.

L. R.

MUIR (E.). **Report on a Visit to the Leper Island of Culion and on the Anti-Leprosy Work in the Philippine Islands.**—*Indian Med. Gaz.* 1925. June. Vol. 60. No. 6. pp. 261–264.

The author points out that in India, with 30 times the population, and probably three times the leper rate per mille, the problem is very different from that in the Philippines, where such important work has been done in the great Culion settlement, including much pathological research. He found very few cases of the first, pre-infective stage of leprosy, although a number of such cases are being treated in the recently opened Say Lazaro hospital at Manilla, where cases, not positive bacteriologically, are now admitted for treatment, the positive ones alone being sent to Culion, and he advocates the establishment of further leper clinics in the Philippine towns on the lines of those being opened in India. He indicates also the weak point of Culion, where so many infections of healthy children have taken place owing to their not being separated from their leper parents at birth, but this is likely to be remedied soon.

L. R.

GRAHAM (J. D.). **Le plan de campagne contre la lèpre aux Indes.**—*Bull. Office Internat. d'Hyg. Publique.* 1925. June. Vol. 17. No. 6. pp. 627–628.

This note quotes from the appeal issued by the Viceroy of India in January last on behalf of the British Empire Leprosy Relief Association, the objects being to encourage the study of the causation and treatment of the disease, to establish clinics for early treatment and isolation refuges for the advanced crippled cases. At the end of March 4½ lakhs (£30,000) had been received. [The total now amounts to 18 lakhs.]

L. R.

READ (B. E.). **The Nature of the Leucocytosis induced in the Rabbit by the Administration of Chaulmoogra Oil and its Derivatives.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 605–612. [9 refs.]

The action of chaulmoogra oil has for long been explained by some workers as depending on a marked " leucocytic action." Experimental work on rabbits showed that treatment with chaulmoogra oil or ethyl-hydnocarpate administered by various methods produces little effect on the red corpuscles in small doses, but in very large ones some haemolysis and reduction of the red corpuscles occurs. Of greater importance are the leucocyte changes; toxic doses produced diminution of the leucocytes, but therapeutic ones caused an increase of about 100 per cent. which remained to a considerable extent at the end of a month; control experiments with the ethyl esters of the fatty acids of soy bean and other oils did not show any such effect. Differential counts show that the most striking change is an increase of the monocytes from about 1 per cent. up to as much as 6 per cent., while there was an apparent decrease in the basophiles. Further, blood withdrawn from the right side of the heart revealed showers of macrophages, retained in the pulmonary circulation, which after an intravenous injection of pure oil might form 80 to 90 per cent. of the total white count and persist for 18 hours, and microscopical examination after large toxic doses showed that the liver had been stripped of its endothelial cells. He concludes that "the leucocytosis induced by chaulmoogra oil is a means whereby the drug is brought into direct contact with the bacilli in the lymph circulation."

L. R.

KERR (Isabel). **The Chaulmoogra Treatment of Leprosy at the Hospital for Lepers, Dichpalli, Hyderabad State.**—*Lancet.* 1925. Aug. 22. pp. 373–375. With 3 text-figs.

This paper gives the results of 4½ years careful trial under favourable hospital conditions of recent preparations of chaulmoogra and hydnocarpus oils in association with E. MUIR, charts and records of the cases being kept. MUIR'S E.C.C.O. mixture of ethyl esters of *Hydnocarpus wightiana* with creosote, camphor and olive oil were mainly used; control trials of creosote and olive oil produced little effect, and later the pure esters, with creosote or iodine as an antiseptic, were used, and pushed up to even 16 cc. weekly. In some, in addition, a vaccine of Kedrowsky bacillus vaccine was used to increase the frequency of the reactions, the aim being to keep the patients on the point of reacting; reactions of 48 hours were capable of bringing about a great deal of improvement, and the author always found that minimum doses of 0·25 cc. bring down the temperature. Complicating syphilis, malaria, etc., must be treated as well. MUIR'S more recent method of infiltrating the esters combined with creosote 4 per cent. beneath the skin lesions, has given the quickest results, and causes no inconvenience beyond temporary burning sensation, so the patients prefer it to the intramuscular injections; a 1 in 4 solution of trichloracetic acid also is painted over the lesions, both given weekly. Early cases show improvement in a few weeks, but older ones naturally require much longer. By infiltration as much as 20 cc., or even more, can be given weekly. Esters of linseed and olive oil gave less marked improvement. The results in 180 cases treated in 1923–24 were as follows: "17 per cent. became symptom free, 45 per cent. very much improved, most of them likely to become symptom free; 35 per cent. improved; 3 per cent. worse or dead. Of infective cases 63 per cent. have become non-infective."

L. R.

FOWLER (Henry). **A Review of and some Observations in the Modern Treatment of Leprosy in China.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 594–600.

The author gives a brief history of his use of chaulmoogra oil and its derivatives in China. He began over 25 years ago with trials of the crude oil orally, and again as the result of DYER'S advocacy in

1906, but without success. Later he had another failure with HEISER'S intramuscular injections of the oil, which only produced some improvement in the general health of the lepers after 22 months careful trial, although J. WILSON at Kwangju, in Korea, is now reporting good results with injections of large doses of the Chinese *Hydnocarpus anthelmintica* oil. Next, ROGERS' sodium hydnocarpate and morrhuate were used, and are still in use in parts of China in spite of more potent remedies being now available; " reports as to curative results are somewhat conflicting, but on the whole positive in character." Recently the esters of Chaulmoogra and Hydnocarpus oils have been used, with undoubtedly the most successful results so far, in some 43 China stations from which reports have been received, although no statistical tables of the cures obtained can yet be given; the earlier the case and the younger the patient the better is the prognosis. Chronic cases improve to some extent and lose the former characteristic disagreeable odour of leper homes, while their general health improves. Moogrol and the triply distilled Pekin Union Medical College esters, plus a 20 per cent. solution of creosote in camphor oil, or 20 to 25 per cent. pure camphorated oil, have proved best in doses increased to the point of tolerance of the patient, which varies widely. Prolonged oral administration of the esters produces fatty degeneration as shown by B. E. READ. Tartrate of antimony has not been successful in China, and the ethyl ester chaulmoograte treatment holds the field, although it often fails in sub-acute and chronic cases and in some early ones. Finally, he thinks a combination of segregation and treatment is necessary, but very difficult to carry out in present Chinese conditions.

L. R.

VURPILLAT (F. J.). **The Use of Extractives of Chaulmoogra and Cod-Liver Oils in Leprosy and Tuberculosis.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 587–594. [20 refs.]

The author gives a good epitome of the published work from that of ROGERS in 1916 to date, and remarks that the available literature is remarkably small considering the importance of the therapy of acid-fast organisms. He believes further experimental and clinical trial of these substances is warranted in tuberculosis, with which he chiefly deals.

L. R.

AOKI (Taiyu), KAWAMURA (Kasayuki), KAMIKAWA (Yutaka) & FUKAMACHI (Roan). [**On the Intravenous Injection of Derivatives of Chaulmoogra Oil against Leprosy. III.**]—*Hifuka Hitsunyokika Zasshi* (*Jl. Dermat. & Urol.*). 1924. Apr. Vol. 24. No. 4. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. p. 108.]

This report deals with only 45 cases treated with four different preparations with improvement in 11. No details of the stage of the disease are given.

L. R.

MALCOMSON (J. E.). **Leprosy.**—*U.S. Nav. Med. Bull.* 1925. May. Vol. 22. No. 5. pp. 594–598.

Two years' treatment of 68 cases in the Virgin Islands is reviewed, 26 patients who refused treatment serving as controls. Careful records showed that 20 treated anaesthetic men showed an average reduction of anaesthesia from 28 to 16 per cent., while 13 controls showed increases from 64 to 71 per cent., and similar results were obtained in the women. Further, of 15 treated nodular cases 13 have improved, while of 11 controls none improved and 7 are worse. Improvement in ulcers was not so marked, except in the important respect that the lepra bacilli disappeared from all the positive cases under the treatment, and in the younger and earlier cases the organisms also disappeared from the nasal secretion, but not in advanced chronic cases.

L. R.

O'BRIEN (Henry R.) & RUNCHAIYON (Boon Mahk). **Treatment of Leprosy in Bangkok with Ethyl Esters from** *Hydnocarpus Anthelmintica.—China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 600–605.

The authors report on the use of ethyl esters made from the seed of *Hydnocarpus anthelmintica* at Bangkok, Siam, where the trees are present in large numbers. The lepers in Siam are estimated at not less than 15,000, and two years' trial of the locally prepared drug is now recorded. The esters are made by heating the crude oil with alcohol and sulphuric acid about 15 hours, washing with water, caustic soda and water again successively until neutral, drying and distilling under 10 mm. reduced pressure, filtering and sterilizing. A leper hospital with 140 beds was opened, and here and in the out-patient clinic over 1,600 cases have now been treated, beginning with 0·5 cc., and increasing by 0·25 cc. per week to as much as the patient would tolerate, and a maximum of 4 cc. Some instead took from 1 to 5 cc. daily by the mouth owing to pain on injection. Slight febrile reactions were regarded favourably. On re-examining 357 cases in July and August, 1924, very similar results were found in cases both under and over three years' duration: namely, 0·7 and 0·5 per cent. much worse; 4·3 and 6·8 per cent. worse; 24·6 and 21·0 unchanged; 48·6 and 48·4 improved, and 21·7 and 23·3 much improved. No complete cures can yet be reported, although the combined figures show 71·1 per cent. improved, and in 22·7 per cent. improvement was quite marked. As might be expected, the hospital cases showed more progress than the out-patients. The Government laboratory hopes soon to be able to supply the esters to other countries.

L. R.

READ (B. E.) & FENG (C. T.). **Notes on the Preparation and Use of the Ethyl Esters from "the Chaulmoogra Oils."**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 612–618. [10 refs.]

The Pekin Union Medical College has been making these preparations for some years, and advise the following method:—

"2,500 grams of the crude fatty acids prepared by Dean's method are mixed with 2,500 cc. of 95 per cent. alcohol in a 6 litre flask, 50 cc. of strong sulphuric acid are added, and the mixture heated on a hot plate under a reflux condenser for from 8 to 10 hours. When esterification is considered complete the contents of the flask are poured into warm water, separated and washed with dilute caustic soda to remove excess of mineral acid and any uncombined fatty acids.

"The crude esters are distilled *in vacuo* at 2 mm. pressure. The first runnings are placed aside and added to a mixture of material in a waste jar which is later worked over again. The water white distilled esters are poured into two or three litres of 0·05 N sodium hydrate solution. After gentle rotation the mixture is allowed to stand for several hours when it separates into two clear fractions. This is repeated until an excess of alkali has been used, as shown by indicators. The washed esters are separated and dried and stocked in litre bottles which are placed in a refrigerator for 48 hours. At the end of this time they are carefully examined to see if any solid material has separated out. The presence of free fatty acids on cooling will show a decided sediment which can be filtered off and the specimens treated and re-distilled and re-washed. The resulting product is guaranteed to be free from irritating acids whether they be inorganic or organic."

Fractionation to obtain the hydnocarpic acid fraction has also been carried out, the fraction boiling around 215° being practically pure ethyl hydnocarpate and representing about 12 per cent. of the original mixed ethyl esters; the major part of the hydnocarpus fraction was obtained at a temperature of 184° to 190° at a reduced pressure of 2 mm. The method of preparation described above enables the pain-producing free fatty acids to be removed. Camphor, which is regarded by FOWLER as useful in lessening the pain, is soluble in esters up to 33·7 per cent., while 4 per cent. creosote is preferred by MUIR.

L. R.

i. READ (Bernard E.). **The Oral Administration of Chaulmoogra Oil in the Treatment of Leprosy.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 619–623. [1 ref.]

ii. ——. **Bibliography of Chaulmoogra Oil.**—*Ibid.* pp. 623–631.

i. The methods of O. E. A. TRAVERS and others of giving chaulmoogra oil orally are reviewed, and stress is laid on the necessity of obtaining fresh oils free from any rancidity, that of *Taraktogenus kurzii* being especially liable to undergo this change and to upset the stomach. It is also advised not to attempt to give very large doses orally, but about 6 drops once daily or even less frequently if progress is obtained, while magnesium salts, as a laxative, and calcium salts appear to be indicated as adjuvants to chaulmoogra oil or its esters.

ii. A valuable bibliography of 157 papers with an index to the authors' names.

L. R.

MUIR (E.). **Some Points of Importance in dealing with the Leprosy Problem.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 575–584. With 1 chart & 2 figs. on 1 plate.

In addition to narrating previously published work this paper brings forward a modification of the new treatments, which may prove of great practical importance. He had previously shown that the undistilled esters of fresh *Hydnocarpus wightiana* oil are less painful and more readily absorbed than distilled ones. Further investigation has shown that when the oil is cold-drawn from the fresh seeds of this common South Indian tree it is still clear and transparent, and even less painful than the esters. It is borne in larger doses, even up to 24 cc., is more readily absorbed, especially when given by MUIR's infiltration method into the subcutaneous tissues beneath the skin lesions, and, as far as the present trials go, it seems to be not inferior, and it may prove considerably superior. The dose has been worked up to 20 cc. and over in some cases. [Its cost is less then one-tenth of that of the corresponding esters, and it can be obtained in any quantity from Smith, Stanistreet & Co., of Calcutta.]

L. R.

PALMER (F. J.). **The Treatment of Leprosy by Metallic Salts.**—*Proc. Assam Branch British Med. Assoc. Ann. Meeting. Jorhat. 2nd Mar., 1925.* pp. 10–21.

The author tried copper salts in leprosy without knowing that they had been used in Japan and Italy for a number of years. 1½ grains of copper citrate and 2 grains of tartrate of bismuth, injected intravenously, was often followed by severe and sometimes prolonged febrile reactions (such as the most experienced workers now regard as harmful in leprosy), the patients becoming worse for a time, but improvement followed, as often occurs for a time after reactions, although no case had cleared up at the time of writing. Notes are given of three cases treated by both drugs, and illustrating the reactions, which included the breaking out of fresh ulcers, yet he is " with increasing confidence looking forward, not to arrested diseases, but to complete elimination of the leprosy bacillus."

L. R.

MUIR (E.). **Leprosy—Diagnosis, Treatment and Prevention.**—*Trans. S. Indian Branch Brit. Med. Assoc.* 1925. Vol. 17. No. 3. pp. 105–124.

——. **The Present Position of the Treatment of Leprosy.**—*Jl. Roy. San. Inst.* 1925. Sept. Vol. 46. No. 4. pp. 131–134.

These papers summarize the author's well-known work, which has already been dealt with in connexion with earlier papers.

L. R.

HEISER (Victor G.). **The Present Status of Treatment for Leprosy.**—*China Med. Jl.* 1925. July. Vol. 39. No. 7. pp. 591–594.

This eminent leprologist considers the reports on the use of chaulmoogra esters to be very favourable, especially in the extensive trials in many hundreds of cases in Hawaii and the Philippines, which eliminates the factor of chance in small series; 23·5 per cent. of 327 admissions to the Honolulu Hospital have been paroled as negative in three years, and of the remaining cases 60 per cent. were improved, and in 31 per cent. the disease was arrested, leaving only 8 per cent. uninfluenced by the treatment. He mentions that at the United States Carville leper hospital DENNEY and HOPKINS are now obtaining still more remarkable results, not yet published, by weekly intravenous injections of 2½ milligrams per kilo body-weight of mercurochrome in a 1 per cent. watery solution. Antimony has not met the expectations aroused by the first South African reports. Much research work is now being done in five or six countries, and " when it is considered that only a few years ago a recovered case of leprosy was almost unknown, while now such cases can be counted by the hundreds, there is much reason for optimism. A great improvement in the whole leprosy situation could undoubtedly be brought about if the many thousands of lepers now at large were treated to the point of becoming closed cases."

L. R.

RODRIEGUEZ ARJONA (Vicente). **Zur Antileprolbehandlung der Lepra.** [The Antileprol Treatment of Leprosy.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. July 1. Vol. 29. No. 7. pp. 334–339.

The author describes in detail a course of treatment with Antileprol lasting ten months, administered to eleven patients in a very advanced stage of leprosy. All were without doubt improved ; not a single case of exacerbation or death occurred. The oral, intramuscular and intravenous methods were tried, the last-named upon only two patients, as the other nine refused to submit to it. The author, however, prefers the intravenous method of application, and recommends a dose (for his climate, *i.e.*, Yucatan) of 1·5 cc. twice a week.

L. R.

ABERASTURY (Maximiliano). **Proyecto de Ley Nacional sobre tratamiento de la lepra.** [Proposed National Law for Dealing with Leprosy.]—*An. del Depart. Nac. Hig.* Buenos Aires. 1923. Mar.–Dec. Vol. 29. No. 2. pp. 68–88.

The numbers of lepers in the Argentine has been increasing for many years. In the Muñiz Hospital in Buenos Aires in 1906 there were 29 cases ; now there are 125, of whom 76 are Argentinos and 49 foreigners. The question of dealing with them is a complicated one, and a comprehensive series of proposals has been drawn up ; these are cited in detail. The first section is concerned with compulsory notification of cases ; doctors, the parents of an infected child, heads of firms, officials of the Army and Navy, proprietors of hotels, and so forth, are all to be bound to notify any case coming under their observation. Next are rules for the strict examination of all suspects and the reference of all doubtful cases to a Board. Thirdly, measures are proposed for treating all lepers in asylums, sanatoria, or colonies, and also those isolated at home, and all those who, though infected, are not regarded as dangerous. To avoid any misunderstanding these classes are defined : thus, the non-dangerous are those who have "no lesions capable of transmitting the disease by contact, who harbour no bacilli in the nasal, buccal or pharyngeal secretions," and have been declared after strict examination to be innocuous. Those treated at home must carry out proper disinfection and prophylactic measures and are prohibited from the exercise of any profession or performance of any work which directly or indirectly may cause spread of the disease by contagion. Next follow regulations, on the usual lines, for the management of leper colonies and for dealing with married persons one of whom is infected, and also with the children of such. The last section gives the disciplinary measures for infringement of these laws.

H. Harold Scott.

GALLI-VALERIO (G.). **Untersuchungen ueber Lepra.** [Investigations on Leprosy.]—*Virchow's Arch. f. Path. Anat. u. Physiol.* 1925. Feb. 24. Vol. 254. No. 3. pp. 765–770. With 3 text figs. [12 refs.]

Having the opportunity of studying the disease among the lepers of the Canton of Wallis in Switzerland, the author carried out a number of experiments. For streak preparations he used Ziehl's hot fuchsin stain, decolorizing with a ⅓ aqueous solution of Ac. nitricum, and counter- staining with thymol blue (piana blue). For sections he preferred Fränkel-Gabbet's method. Lepra bacilli were found in all lesions, in the nose, often in the skin, and in one case in the faeces.

Two white rats were inoculated in the brain. One died after 2 days, the other after 4 months. Lepra bacilli were recovered in both cases from the brain, but from no other organs. [These were probably dead bacilli.]

On examining the contents of lepromata after treatment with ROGERS's gynocardates and MCDONALD & DEAN's ethyl esters, the following changes in the lepra bacilli were found:—

Although some bacilli were still in a good state of preservation, the majority were in more or less far-advanced state of lysis. Some still kept their normal form, but were stained only in part and showed chains of granules, and some conglomerations were entirely transformed into a mass of fine granules. The same changes were found in the nasal secretion.

The author then examined several times over a period of months some ethyl-ester of chaulmoogra oil containing lepra bacilli. Although lysis of some bacteria occurred, the great majority remained quite normal. He concludes that, although these substances have an inhibitory effect upon the development of the bacilli, this effect is only manifested where the ethyl ester comes into immediate contact with the bacilli. This, however, cannot explain the great lysis of lepra bacilli which occurs in the lepromata with relatively small doses of ethyl esters. He, therefore, concludes that the decomposition products of chaulmoogra-oil act upon the organism itself, promoting the production of lipases, which attack the outer shell of the Hansen bacterium, and cause its lysis. [This was previously suggested by ROGERS.] It is also very probable that the products of the lysis, when they are absorbed, in their turn act upon the organism and promote the formation of antibodies, which contribute to the cure.

L. R.

ROSENTUL (M.) & KRUGLAK (E.). **Zur Frage der bakterioskopischen Diagnose der Lepra.** [The Bacteriological Diagnosis of Leprosy.]—*Deut. Med. Woch.* 1925. May 22. Vol. 51. No. 21. pp. 866–867. [6 refs.]

The authors strongly recommend the method of GRENBAUM and SCHAMBERG for the diagnosis of leprosy, and describe two cases in which it was successful in the early recognition of the disease.

They also tested Prof. W. W. IWANOW's view of the value of puncturing the inguinal gland. Their technique is described in detail, and their results are summarized as follows:—

64 cases were examined, 26 of lepra tuberosa, 16 of lepra mixta, 22 of lepra maculo-anaesthetica.

Positive results in nodular and mixed cases, 100 per cent.

Positive results in maculo-anaesthetic cases, 95 per cent.

One negative result only in a patient previously treated by Hamzan's thymol method.

Previous treatment with nastin, chaulmoogra oil, thymol, and turpentine oil, in 28 cases had no influence on the result of the bacteriological examination.

The finding of globi in the gland puncture fluid supports, in the authors' opinion, the theory of IWANOW and others against that of UNNA, *viz.*, that the globi represent a conglomeration of bacilli which possibly originate by agglutination.

L. R.

KONDO (Seigo). **Der Verwendungsstoffwechsel der sogenannten Leprabacillen.** [The Katabolic Activity of the So-called Lepra Bacilli.] —*Ztschr. f. Hyg. u. Infektionskr.* 1925. June 6. Vol. 104. No. 4. pp. 714–728. [32 refs.]

Metabolism experiments were tried with 13 strains of acid-fast bacteria that had been cultivated from leprous material, from which there emerges the fact that very considerable differences exist between the behaviour of the individual strains. While on the one hand the acid-fast bacillus of ROST and WILLIAMS (L3) cultivated from leprosy possesses about the same metabolic activity as, *e.g.*, the acid-fast saprophytic bacteria, the Nabarro-Bayon strain (L11) on the other hand is in this respect related to the tubercle bacilli of warm-blooded animals which are characterized by a small katabolic activity (especially in their behaviour with sodium citrate, glycerin, mannite, acetate, grape-sugar and sodium asparaginate). The remaining strains cultivated from leprous material group themselves between these two extremes and in their conditions of growth partly resemble the tubercle bacilli of cold-blooded animals. This latter fact, that no sharp limits, but only gradual transitions, exist between the two extremes, strengthens the possibility that we have here, in spite of the differences of their metabolic activity, only varieties of a single bacterial species, especially when we take into account the fact that all the strains come from leprous material and therefore from an identical medium. In face of this it is impossible, on the basis of metabolic experiments, to separate the acid-fast strains cultivated from cases of leprosy from other acid-fast bacteria.

L. R.

KONDO (Seigo) & NODAKE (Rishichi). **Ueber die Bedeutung der Wasserstoffionenkonzentration für die Entwicklung der sogenannten Leprabacillen auf künstlichen Nährböden.** [The Significance of the Hydrogen Ion Concentration for the Development of So-called Lepra Bacilli upon Artificial Culture Media.]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. Aug. 19. Vol. 105. No. 1. pp. 67–73. [5 refs.]

1. By cultivation upon nutrient solutions of various reactions, the limits of growth were found for a number of acid-fast bacteria,

which had been obtained from leprous material. It was found that all strains, in contrast to the genuine tubercle bacilli of warm-blooded animals, show a very considerable extent of growth that approaches fairly closely that of saprophytic acid-fast bacilli. On the acid side the limit of growth of all lepra strains lies at pH 5·7, while on the alkaline side considerable differences were demonstrated between the individual strains. It is noteworthy that the extent of growth of the strains on synthetic culture media is slighter than on glycerin broth.

2. The changes of reaction occurring in an originally neutral (pH 7·1) fluid under the influence of the development of these micro-organisms allow in general 3 types to be distinguished, but the cultures of one and the same strain often do not show a uniform behaviour. The results of the comparative experiments made with glycerin broth and two synthetic solutions point to the dependence of this change of reaction upon the composition of the nutrient medium.

L. R.

CHUMA (M.). & GUJO (K.). **Eine histologische Untersuchung ueber das Leprom mittels Vitalfärbung.** [A Histological Investigation of Leproma by means of Vital Staining.]—*Virchows. Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 240. No. 3. pp. 469–482. With 3 text figs. [20 refs.]

The authors found that they were unable (on one occasion) to stain leprosy nodules by the direct injection of toluidin blue, and had difficulty in vital staining by soda carmine. Indian ink, however, diffused well into the nodules. They find lepromata of the skin to be largely composed of cells capable of storing up dyes or carbon particles in granular form ; in parts of the nodules where dye is not present poor permeation may be supposed. The granulation cells in which the dye collects are chiefly epitheloid cells and Virchow's leprosy cells. It is these cells which contain the lepra bacilli, which may be found side by side with dye granules. The connective tissue cells also store up these substances and are phagocytic. The authors therefore assume that the leprous epithelioid cells are histioid. The leprous infiltration, according to most investigators, has its origin preferably in the neighbourhood of vessels, sweat glands and sebaceous glands, where histioid cells are present in large quantity and in a resting condition. They believe that the histioid cells play an essential part in the formation of the leprous infiltration.

L. R.

SIMON (Louis). **Lèpre et réaction de Wassermann.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 378–379.

The author has continued the work of MATHIS and BONJEAN, who found 40 out of 41 leprosy cases had negative Wassermann reactions, and he reports on 24 cases. He obtained positive results in 23 (15 strongly so), and the remaining one doubtful by the method of Calmette, Massol and Hecht. He thinks, therefore, that the Wassermann reaction is positive in leprosy.

L. R.

FRAZIER (Chester N.) & WU (Hsien). **Blood Serum Globulin in Leprosy.**—*Amer. Jl. Trop. Med.* 1925. July. Vol. 5. No. 4. pp. 297–306. [9 refs.]

Of 32 cases of leprosy 17 showed excess of serum globulin by the precipitation test of degrees varying from 1 to 3 plus. The percentage of globulin was estimated; the nodular cases averaged 4·68 per cent., the mixed cases 4·52 per cent., the active maculo-anaesthetic cases 4·23, and the latent ones 3·11 per cent. Apparently the serum globulin in long-standing cases with clinically latent infection decreases to within the normal range, so the reaction will be worth studying in relation to the effects of treatment.

L. R.

MACCORMAC (Henry). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Section of Dermat.). 1925. Sept. Vol. 18. No. 11. p. 61.

PUPO (Joao de Aguiar). **Estado actual da therapeutica da lepra.**—*Ann. Paulist. Med. e Cirurg.* 1925. Jan.–June. Year 13. Vol. 16. No. 1–6. pp. 1–16. [49 refs.]

RICHMOND (P.). **Leprosy at the United States Naval Hospital, Great Lakes, Illinois—Report of a Case.**—*U.S. Nav. Med. Bull.* 1925. July. Vol. 23. No. 1. pp. 25–28.

HELMINTHIASIS.

JOYEUX (Ch.). **L'épidémiologie et la prophylaxie des helminthiases.**—*Bull. Acad. Méd.* 1925. Apr. 14. Year 89. 3rd Ser. Vol. 93. No. 15. pp. 405–408.

The study of the zoology and biology of helminths has provided the medical pathologists with a large number of interesting data bearing upon the epidemiology and prophylaxis of worm maladies. The author notes some of the more recent discoveries, dealing particularly with the "specificity of hosts and its medical consequences," which he illustrates by reference to *Ascaris lumbricoides* and *A. suis, Fasciolopsis buski, Hymenolepis nana* and *H. fraterna.* The peculiar geographical distribution of *Hymenolepis nana* in man is said to depend upon factors yet unknown, although the life cycle of the parasite has been elucidated.

R. T. Leiper.

JOYEUX (Ch.). **Epidémiologie, prophylaxie et thérapeutique des helminthiases d'après les travaux récents.**—Reprinted from *Biol. Méd.* 1924. Vol. 14. No. 5. 31 pp. With 11 text figs. [9 refs.]

This excellent résumé of recent work in Helminthology does not lend itself to abstraction. It discusses the information collected during the past decade in life-histories and prophylaxis and the more recent discoveries in helminthic therapeutics. It concludes with a review of the workers and publications in helminthology outside of France and regrets that so little has been done in that country.

T. W. M. Cameron.

JOYEUX (Ch.). **Les migrations des helminthes dans l'organisme humain.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 355–361. With 2 figs.

Joyeux gives a general outline of the principal helminthic infections of man. He groups them into those penetrating the skin or having a blood-sucking insect as intermediate host, and those entering by the mouth. Abnormal migrations may occur, and he cites the development of *Cysticercus cellulosae, Coenurus cerebralis* and Sparganum in various positions, *Fasciola hepatica* under the skin and in the lungs, Paragonimus in the brain, Ascaris in various localities, and Oxyuris in the sub-mucosa, peritoneal cavity and female genitalia.

T. W. M. C.

JOYEUX (Ch.). **L'épidémiologie des helminthiases.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 366–371. With 4 figs.

This paper deals briefly with the diagnosis of helminthic infections by means of ova or adults in the stool, sputum, urine or blood, or by serological examination ; and with general measures of prophylaxis.

T. W. M. C.

RAILLIET (A.). **Les helminthes des animaux domestiques et de l'homme en Indochine. (1re Partie).**—*Bull. Soc. Zool. de France.* 1925. Apr. 10. Vol. 49. No. 8–10. pp. 589–608.

This is the first part of a summary of an extensive but not published work, which is available for reference at the Laboratory of Parasitology at Alfort, France. The summary consists of an annotated list of the Flat-worms of man and the domestic animals in Indochina. Several new species—none of them human—are described. The human parasites from this region referred to in Railliet's article are as follows :—

Fasciola hepatica.
Fasciolopsis buski.
Opisthorchis felineus and *O. viverrina.*
Clonorchis sinensis.
Euparyphium malayanum.
Paragonimus westermani.
Schistosoma japonicum.
Gastrodiscoides hominis.
Dibothriocephalus latus and *Sparganum mansoni.*
Taenia solium, Taenia saginata and Hydatid.
Raillietina madagascariensis.
Hymenolepis nana.

T. W. M. C.

WYCKOFF (Harry A.) & FRENCH (William O.). **Intestinal Parasites among Filipino Food Handlers.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 4. Vol. 84. No. 14. pp. 1029–1030.

Since many of the Filipinos who come to the United States obtain employment in kitchens and as waiters, the authors examined 34 such, and found that 28 of them harboured intestinal parasites of one form or another—hookworm in 21, Trichuris in 16, amoeba cysts in 10 [the nature of Amoeba is not stated]. All those with hookworm were given 10 cc. of carbon tetrachloride ; two months later 14 of these were re-examined and no ova were found in any.

H. Harold Scott.

YASUTAKE (Teruichi). **Statistische Studien ueber intestinale Parasiten in der Gegend von Okayama.**—*Okayama-Igakkai-Zasshi* (*Zentral. d. Okayama med. Gesellshaft*). 1925. July. No. 426. German summary p. 748. [In Japanese.]

Contrary to the findings recorded by previous investigators the author, from examinations carried out between 1917 and 1922, found Ascaris to be the most frequently present helminthic parasite ; next to this the Trichuris, and to a considerably less degree *Ancylostoma duodenale* and *Distomum spathulatum.* Ascaris, Trichuris and Oxyuris were more common in women, Ancylostoma and Distomum in men. Tapeworms were rare but more often seen in men than women. Negative cases are increasing in numbers year by year as a result of measures now taken in hand.

H. H. S.

SIMON. **Parasites intestinaux du Cambodge.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 61–64.

The commonest human parasite in this area is Ascaris, occurring in 88 per cent. of cases. Hookworm (apparently *Necator americanus*) is found in 22 per cent. of the population, but Strongyloides and whipworms are relatively rare. *Ascaris canis* was found on two occasions in man, and *Taenia saginata* in 5 out of 335 cases examined.

T. W. M. C.

HALL (Maurice C.) & CRAM (Eloise B.). **Some Laboratory Methods for Parasitological Investigations.**—*Jl. Agric. Res.* Washington. 1925. Apr. 15. Vol. 30. No. 8. pp. 773–776. With 1 text fig. [5 refs.]

The writers suggest the use of a nest of sieves, such as that described by the senior author in 1917, as an indispensable part of the equipment of a Parasitological Laboratory for examining faeces and intestinal contents for helminths and their eggs.

T. W. M. C.

REMLINGER (P.). [**Chylurie, Éléphantiasis et Filariose au Maroc.**]—*Maroc. Méd.* 1924. Apr. 15. pp. 109–11. [Summarized in *Bull. Inst. Pasteur.* 1925. Feb. 15. Vol. 23. No. 3. p. 144.]

Although chyluria and elephantiasis are not uncommon in Morocco, Bilharzia or Filaria in man has not been found. Chyluria is sometimes due to the opening of Hydatid cysts into the urinary tract.

T. W. M. C.

IWAHASHI (Uyematsu). [**Relation between the Bird and the Eggs of the Parasites.**]—*Iji Shimbun* (*Med. News*). 1925. Apr. No. 1161. [Summarized in *Japan Med. World.* 1925. June 15. Vol. 5. No. 6. p. 156.]

By feeding birds (kind not stated) with faeces containing eggs of parasites it was ascertained that the eggs passed in 2 to 9 hours, the maximal elimination occurring in 3 hours. The author believes that he has observed the domestic goose to pass ascaris eggs (in 9·6 per cent.) and oxyuris eggs (in 33·3 per cent.) which had been derived from natural infection.

R. T. L.

SPENCE (B. H. H.). **The Eradication of Helminthiasis from the Egyptian Army.**—*Jl. Roy. Army Med. Corps.* 1925. May. Vol. 44. No. 5. pp. 321–342. With 8 text figs.

This paper, though containing nothing original as regards the eradication of the two forms of helminthiasis dealt with, gives some interesting statistics relative to the prevalence of ankylostomiasis and schistosomiasis in the Egyptian Army. The lack of resistance of the Egyptian recruit and soldier to the hardships incidental to training and service is not due, as some have believed, to "inherent defect," but to helminthic infection.

The author examined 292 recruits and found 91 per cent. harbouring worms of some sort; 73 per cent. with hookworms, and 52 per cent. with schistosomes. The former were treated with 5 cc. of carbon tetrachloride followed two hours later by 25 gm. of magnesium sulphate in 50 cc. water. In spite of the dose being larger than that usually given few showed any untoward effects, and, when re-examined 3 months later, 75 per cent. were found to be still free. Thymol and oil of chenopodium gave less satisfactory results.

Schistomiasis cases were treated with antimony sodium tartrate injected thrice weekly, starting with 0·5 grains and increasing to a maximum of 2 grs., a total of 21 gr. being given in four weeks. 95 per cent. of the cases of *S. haematobium* infection appeared to be cured, no ova being found three months later. Probably, had the full course recommended by CHRISTOPHERSON been administered, the remaining

5 per cent. would also have been cured. A very small proportion of the patients harboured *S. mansoni*: 0·3 per cent. of 1,264 recruits, and 1 per cent. of 2,352 soldiers serving in Cairo.

H. H. S.

WELLS (Herbert S.). **A Quantitative Study of the Absorption and Excretion of the Anthelmintic Dose of Carbon Tetrachloride.**—*Jl. Pharm. & Experim. Therap.* 1925. Apr. Vol. 25. No. 3. pp. 235–273. With 5 text figs. [27 refs.]

This article details the results of some ingenious experiments devised to estimate quantitatively the absorption of carbon tetrachloride from the dog's intestine, when given in the therapeutic dose of 3 cc., and also the excretion of the drug by various routes, in particular the respiratory. Chemical minutiae are dwelt upon at some length. Briefly, the tissues to be analysed for the drug were cut up under 97 per cent. alcohol in the distilling flask and the condensed vapours were received into alcohol. It was found that there was almost constantly a loss of 7–10 per cent. during the distillation.

The intestine of the experimental animal is tied tightly at the end of the colon and also the duodenum at the tip of the pancreas; the drug is then injected into the duodenum, the needle of the syringe being embraced by the ligature. The dogs were killed at periods varying from one to twenty-seven hours afterwards. The absorption rate was found to be remarkably regular over the whole period. It was found that 50 per cent. alcohol did not alter the rate, but when the carbon tetrachloride was injected in solution in 95 per cent. alcohol absorption was increased considerably, even though water might be subsequently added to reduce the concentration of the alcohol to 50 per cent.

The author rightly stresses the point that these animal experiments must not be taken as applying equally to man. With magnesium sulphate the rate of absorption was little, if at all, altered.

To solve the question of excretion analyses were made of the blood, urine, bile and expired air. As the drug has to pass through the liver and lungs before reaching the systemic circulation much is dissipated, and the blood analyses are, therefore, not of much service. Very little appears to be excreted in the urine and none was found in the bile.

Excretion was demonstrated to take place completely and rapidly after absorption by the expired air. The author experimented upon himself, taking the drug first by mouth and later by a duodenal tube, and found that, whereas in dogs absorption appeared to proceed at an almost uniform rate, in man there was a rapid absorption at first, and then a marked fall in the rate.

When given, as at present, in a fixed dose of 3 cc. by mouth, especially when no dietetic regulation is carried out, the concentration and rate of entry into the duodenum is probably very variable. A smaller amount would, therefore, probably suffice if given by the duodenal tube, provided patients would submit to such a method. It was shown that in dogs even the dose of 3 cc., which is considered as perfectly safe, does considerably injure the liver. The author consequently advises the tube method of administration for special cases, such as alcoholics and small children, in whom considerations of safety would outweigh ease of administration.

H. H. S.

HALL (Maurice C.) & CRAM (Eloise B.). **Carbon Trichloride as an Anthelmintic, and the Relation of its Solubility to Anthelmintic Efficacy.**—*Jl. Agric. Res.* Washington. 1925. May 15. Vol. 30. No. 10. pp. 949–953. [11 refs.]

Experiments show that carbon trichloride has no anthelmintic value. Attention is drawn to the fact that the order of efficiency of the chlorine compounds of ethane and methane is as follows: CCl_4, $CHCl_3$, $C_2H_4Cl_2$, and CCl_3, and an attempt is made to relate this efficiency with their solubility. The authors consider that a chlorine compound with approximately the same chlorine content as carbon tetrachloride, but slightly less soluble, might be safer if not more effective.

T. W. M. C.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **Tetrachlorethylene, a New Anthelmintic.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 229–237.

Tetrachlorethylene appears to be as effective a drug as carbon tetrachloride against hookworms in dogs; it may even be slightly more effective. The factor of safety, pathogenicity, and contraindications appear to be about the same as for the older drug. The present cost of the drug is about three times that of carbon tetrachloride; but the writers suggest that the dose for man would not be over 3 cc., and might even be 2 cc.—a smaller dose than of carbon tetrachloride. It is suggested that a purge should be administered with tetrachlorethylene in order to reduce any transient bad effects. It has a pleasanter taste and odour, and it is suggested that it should be cautiously tested under hospital conditions in order to ascertain its value against human hookworm disease.

T. W. M. C.

MALCHI (A.). [**Two Cases of** *Schistosoma mansoni* **in Palestine.**]—*Harefuah. (Palestine Hebrew Med. Jl.).* 1924. June. Vol. 1. No. 2. pp. 75–79.

Although vesical bilharziasis is stated to be endemic in Palestine, it is the common opinion that the intestinal form does not occur there. The author gives a short account of two cases of intestinal bilharziasis due to *S. mansoni* identified in the course of microscopical examinations carried out in the Hadassah Laboratory at Tel-Aviv.

One case refused specific treatment, but a year later appeared again with the same symptoms. *S. mansoni* eggs were again found in the stools. She received treatment at the Workmen's Dispensary (Dr. M. COHEN), and the two last examinations of the stools proved negative. The second case began the treatment, but after 2-3 injections disappeared.

It is striking that both these cases came from Yemen (Arabia) where intestinal bilharzia is known. But even if the infection were not of Palestinian origin, the existence of such imported cases constitutes a focus for the spread of new infections of intestinal bilharziasis in Palestine.

R. T. L.

CAWSTON (F. G.). **British Indians and Bilharzia Disease.**—*Jl. Trop. Med. & Hyg.* 1925. May 15. Vol. 28. No. 10. pp. 193–195.

Attention is drawn to the fact that prior to the return of troops from Egypt, many of whom remained at Durban, *Schistosoma mansoni* was not known in South Africa except in native labourers imported from Portuguese East Africa for work in the Johannesburg mines. In 1916 the author pointed out that the intermediate hosts of *S. haematobium* and *S. mansoni* were breeding at Durban in large numbers, and that there was consequently a danger of the latter infection becoming endemic there. Further, since numbers of European children, natives and Indians bathe and fish in the pools, and since control of the disease is difficult in the last-named, it is suggested that the Indian Government should ask the Union Government to take steps for the protection of Indian schoolchildren in Natal against schistosome infection.

H. H. S.

WALKER (J. H. C.). **Examination of a Field Company for Schistosomiasis.**—*Jl. Roy. Army Med. Corps.* 1925. May. Vol. 44. No. 5. pp. 382–384.

The accidental discovery of eosinophilia in the blood of a N.C.O. of the R.E. admitted to hospital at Ismaïlia on account of a slight febrile attack led to the examination of the excreta, and ova of *S. haematobium* were found. Further examination of 109 sappers, all of whom had been engaged in bridging operations on a canal containing Nile water, revealed five definite cases of infection. Others who showed pyuria or haematuria were detained for observation and repeated examinations were made for ova, whereby three others were detected. One in whom no ova were found at any time continued to pass blood in the urine, and he was, therefore, subjected to treatment, and his condition cleared up. A table is given of the differential leucocyte counts [apparently on one occasion only] of 10 cases.

H. H. S.

PELTIER (M.). **La bilharziose au Togo.**—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 592–596. With 1 map in text.

The environs of Lake Togo, especially at the mouths of the rivers Haho and Sio, constitute a fruitful source of schistosome infection. The Sio, in particular, abounds in swamp lands in which *Bullinus contortus* thrives luxuriantly. Almost all the children from 8 to 10 years of age suffer from parasitic haematuria and the mortality from this and the anaemia resulting therefrom is very high. During the months July-December almost the entire population live by fishing, the men wading waist-deep in the water, itself kept constantly infected by the urine of the fishermen.

The Sio has, during the last decade, become much more sluggish near its outlet owing to the abundant growth of weeds. Prior to this time schistosomiasis was much less common, and the author suggests that removal of these weeds would not be a difficult or very expensive matter, and would procure inestimable benefit to the inhabitants by reducing, if not eradicating, schistosomiasis and incidentally removing the breeding-places of malarial mosquitoes.

H. H. S.

CULLEN (J. P.). **Asiatic Bilharzia Disease.** [Memoranda.]—*Brit. Med. Jl.* 1925. Apr. 11. p. 694. [2 refs.]

The author calls attention to the fact that during the past twelve months he has reported nine instances of infection by *Schistosoma japonicum* on the frontier of British India and China, and wonders whether this indicates the present westerly limit of the disease. Unless patients are subjected to vigorous treatment with antimony and the Oncomelania is attacked the dangers of further spread are considerable.

H. H. S.

PORTER (Annie). **Some Flukes bred from Cercariae recurring in Schistosoma-Transmitting Molluscs in South Africa.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.) 1925. June. Vol. 18. No. 8. pp. 56–57.

Many of the intermediate hosts of Schistosomes in South Africa harbour other cercariae, and 22 different species have been found in *Physopsis africana,* which is the chief intermediate host for *S. haematobium* and an occasional host of *S. mansoni.* The principal transmitter of *S. mansoni, Planorbis pfeifferi,* also harbours other cercariae, as does *Isodora tropica. S. haematobium* is transmitted by *Physopsis conicum,* and (rarely) by *Limnaea natalensis,* from both of which other cercariae have been recovered—many of them with unknown adults.

T. W. M. C.

BETTENCOURT (A.) & DA SILVA (E. Pereira). **The Cercaria of** *Schistosoma haematobium.* **With Reference to an Article of Blacklock and Thompson on Human Schistosomiasis in Sierra Leone.**—*Arquivos Inst. Bact. Camara Pestana.* 1925. Vol. 6. 21 pp. With 11 text figs. [23 refs.]

The authors disagree with BLACKLOCK and THOMPSON (this *Bulletin,* Vol. 21, p. 941) that it is impossible to separate the cercariae of the human schistosomes. They give a detailed description of the cercariae of *S. haematobium* as found in *Planorbis metijensis* in Tavira (South Portugal) and an illustrated key for the differentiation of the three human forms. The principal criterion of difference depends on the number and nature of the cephalic glands and to a lesser degree on the size.

	S. haematobium.	*S. mansoni.*	*S. japonicum.*
Number of cephalic glands	3 pairs.	5 pairs (Khalil) or 6 pairs (Faust).	5 pairs.
Nature of glands	acidophile.	2 pairs acidophil and 3 pairs (Khalil) or 4 pairs (Faust) basophile.	acidophile.

The authors are convinced that the cercariae studied by them are true *haematobium,* as they were invariably found uncontaminated by other forms, and when mice were infected, adult males and females of *S. haematobium* were recovered.

T. W. M. C.

CAWSTON (F. G.). **The Identity of the Rarer Schistosomes of Man and their Intermediate Hosts.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 215–218. With 2 text figs.

Four distinct types of schistosome ova are found in the urine of schoolboys in Natal, but the life-histories of the different miracidia have not been worked out owing to ignorance of their respective intermediate hosts.

For differentiation of allied molluscan hosts the author suggests more detailed examination of the radulae, as in his previous papers.

H. H. S.

SULDEY (E. W.). **Infection double mixte par** *Schistosomum mansoni* **et** *S. haematobium* **chez un dysentérique amibien.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. p. 458–460.

Urinary infection by *Schistosoma mansoni* and rectal by *S. haematobium* have been recorded, but the present case, a child of 10 years, is of special interest because, in addition to dysentery with the presence of *E. histolytica* in the stools, the stool and the urine contained ova of both schistosomes in the proportion of 15 *S. haematobium* to 2 *S. mansoni*. Emetine was given and the entamoebae disappeared, but this drug had no influence at all on the schistosomiasis. The patient left the hospital still harbouring these worms.

H. H. S.

FAIRLEY (N. Hamilton). **Experimental Studies in Bilharzia Therapy** (*S. spindalis*). **A Preliminary Report.**—*Indian Med. Gaz.* 1924. Aug. Vol. 50. No. 8. pp. 377–381. [23 refs.]

Fairley finds that ova deposition by *Schistosoma spindalis* of the goat is greatest in the liver, but also occurs in the mucosa of the large and small intestine and in the gall bladder, mesenteric and portal-fissure glands, the lungs and pancreas. Dysentery is rarely present however. Ova are always immature when deposited and become mature in the viscera of the host and in untreated animals; not only is there a high proportion of undeveloped ova, but dead ova are also present in large numbers. 19 experimentally-infected goats were treated with 1 per cent. tartar emetic (the maximum dose being 4 cc. on alternate days), but with only partial success, only 5 animals being cured. Urea stibamine was not found to have any therapeutic action. Eight animals were infected with large numbers of cercaria and were afterwards treated with varying amounts of 1 per cent. solution of emetine hydrochloride. Three died from over dosage, but in the other five cases all the female worms were killed; in one case a solitary male was recovered alive. In this goat also some living ova were found, but in the other animals all the ova were dead, although they persisted in diminishing amounts for several months.

Fairley considers that emetine hydrochloride possesses a maximal efficiency in the treatment of this species, and gives much superior results to tartar emetic. He suggests that this may prove to be the case with human bilharziasis as well.

T. W. M. C.

CHRISTOPHERSON (J. B.). **The Cure of Schistosomiasis by the Intravenous Injection of Antimony Tartrate.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 108–111. [12 refs.]

Christopherson considers that FAIRLEY is unjustified in considering that because emetine proved superior to antimony tartrate against *Schistosoma spindalis* in goats, " it will be very surprising if the superiority of emetine hydrochloride does not hold for the human type of schistosomiasis as well." He points out that relapses in human Bilharzia disease are almost invariably due to insufficient dosage, and that where the treatment is sufficient failures do not occur. He endorses LEIPER's view that the ova make their way through the tissues by means of a digestive fluid, and that if the secretive apparatus were paralysed, the ova would be unable to proceed, and would disappear from the faeces and urine. As only a small dose of antimony is required to destroy the ova, ova may be absent before the patient is really cured ; and if they reappear, it is because sufficient antimony has not been given to destroy the adults as well.

He points out that in FAIRLEY's own cases, emetine proved more toxic than antimony, and that this is true for man also, as has been demonstrated at Kasr-el-Ainy in 1923.

T. W. M. C.

LEE (C. U.). **The Treatment of Schistosomiasis japonica.**—*China Med. Jl.* 1925. Apr. Vol. 39. No. 4. pp. 321–331. [17 refs.]

A party of five Roumanian gypsies bathed in the water of the flooded banks of the Yangtse River. Five days later they all, with one exception, suffered from an itching, papular eruption, and four weeks later they had rise of temperature and diarrhoeic symptoms, and ova of *Schistosoma japonicum* were found in the stools. Details are given of two of the patients, one treated by antimony alone, the other first by emetine, later by antimony. The emetine was slower and less satisfactory in its action. The degree of eosinophilia was great—70 per cent. in one and 50 per cent. in the other before treatment, and even at the time of discharge as cured the figures were 27 and 36 per cent. In each there was a still further increase after the first injection of antimony.

H. H. S.

ANDERSON (Ch.) & BANCE (J. E.). **A propos de l'action de l'eau savonneuse sur le miracidium de** *Schistosomum haematobium.*—*C.R. Soc. Biol.* 1925. Apr. 3. Vol. 92. No. 12. pp. 937–938. [3 refs.]

The effect of soap in water upon miracidia of *Schistosoma haematobium* has been differently reported by A. BETTENCOURT and Ch. Anderson. The authors ascribe this to difference of technique, the former employing ova, the latter miracidia. They, therefore, maintain that further experiments are needed and, moreover, that these should be carried out with definite numbers of miracidia, if reliable results are to be attained.

H. H. S.

LEFÈVRE (Raoul). **La bilharziose au Soudan français (cercle de Mopti).**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 720–722. [1 ref.]

The causal agent here is *S. haematobium* only, and of the 19 cases (17 male and 2 female) studied, 18 were vesicular and only one intestinal. The intermediate host for this area has not yet been discovered.

T. W. M. C.

MAEKAWA (Hitoshi). **On the Pathology of Mesenterium in Ascites. 2. Histological Investigation on the Mesenterium in Schistosomiasis Japonica.**—*Kyoto Igakkwai Zasshi* (*Jl. of Kyoto Med. Soc.*). 1924. Dec. Vol. 21. No. 12. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. pp. 107–108.]

Except for the presence of eggs of the parasite the general features of the mesentery in Japanese schistosomiasis agree with those of liver cirrhosis.

R. T. L.

CAWSTON (F. G.). *Gundlachia* **at Malvern, and an Examination of the Radulae of other Intermediate Hosts of the Trematode Parasitic Worms in Natal.**—Reprinted from *Trans. Roy. Soc. S. Africa.* Vol. 13. Pt. 1. pp. 39–42. With 9 figs. on 2 plates.

This paper is concerned, as the title shows, with various molluscan intermediate hosts of trematodes found in Natal, but in that it is devoted entirely to measurements of the snails, their teeth and radulae, the substance is possibly of interest to the malacologist rather than the helminthologist.

H. H. S.

PANG (Chen). **Fecal Examination of Kwangtung Students in Peking for** *Clonorchis sinensis.*—*Nat. Med. Jl. China.* 1925. Feb. Vol. 11. No. 1. pp. 41–45. With 1 map in text.

An outline map of the Kwangtung Province is marked to indicate the prevalence of Clonorchis infection. In 1923, the author examined 115 students entering the Peking National University, and found 43 of them infected (37·39 per cent.). The following year another 38 were examined and 17 found positive. The region most heavily infected endemically was Ch'aochowfu, and there appeared to be a fairly close correlation between the incidence of Clonorchis infection and the habitual consumption of raw fish.

H. H. S.

FAUST (Ernest Carroll). **Some Recent Aspects of the Epidemiology of Clonorchis Infection in China.**—*China Med. Jl.* 1925. Apr. Vol. 39. No. 4. pp. 287–296. With 2 maps. [18 refs.]

As a result of extensive investigations as to the prevalence of *Clonorchis sinensis* the author found that infection was fairly common among the coolie classes in South China, infrequent in the Central Provinces, and unknown in North China in man, though dogs and cats were heavily infected in the Central Provinces, and on an average some 30 per cent. of these animals in N. China. In explanation of these peculiarities it was found that only in the south did man eat fish raw or insufficiently cooked, and furthermore, that in other parts of China the infected fish harboured the encysted larvae on the scales and not at all, or only rarely, in the flesh. As regards the molluscan host *Bythinia striatula* is common throughout China, but none has yet been found infected either of this species or the closely allied *B. longicornis*, *B. spiralis*, or *B. chinensis*, though they may possibly act as intermediate hosts. *Melania hongkongensis* has, however, been shown to be infested.

The paper concludes with an interesting account of the powers of resistance of the cysts of this trematode. Thus, after 54 hours in strong salt brine partial plasmolysis takes place but revival ensues after they are washed in tap water, and the cercariae are still infective; they were no longer viable after 6 days in strong native vinegar. Drying for 54 hours in Peking, whereby the fish-scales are rendered very brittle and the cysts highly plasmolysed, did not render them non-infective after washing in tap-water for an hour.

H. H. S.

KHAW (O. K.). **The Hatching Phenomena of Clonorchis Ova.**—*Proc. Soc. Experim. Biol. & Med.* 1925. May. Vol. 22. pp. 564–566.

Clonorchis ova hatch spontaneously when alternately frozen and thawed, when subjected to sudden rises in temperature, and when the tonicity of the medium is increased and then decreased. Drying, and an acid or alkaline medium (·1 per cent. HCl or NaOH) are very detrimental.

T. W. M. C.

MENGERT-PRESSER (Hilde). **Over** *Metagonimus Jokogawai* **in Ned. Oost-Indie. (Voorloopige Mededeeling.)**.—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 178–186. With 6 coloured figs. on 5 plates. [5 refs.]; also in *Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1925. Pt. 1. pp. 21–26. With 6 figs. on 5 plates.

The author records finding this parasite in the intestine of 8 out of 12 cats and 4 out of 6 monkeys (*Cercopithecus*) but failed to find it in dogs. A description, with 6 coloured figures based on sections, is given.

R. T. L.

KELLAWAY (C. H.). **The Utility of the Casoni Reaction in the Diagnosis of Hydatid Disease.**—*Med. Jl. Australia.* 1925. Apr. 25. 12th Year. Vol. 1. No. 17. pp. 417–418.

Papers by this author, however short they may be, always contain much food for thought, and constitute a stimulus to further research. The intradermal reaction of Casoni yields results in two stages: (1) Within 10 minutes of injection there is produced a large wheal with spider-like outrunners, surrounded by a wide zone of erythema. This fades in an hour or so to be followed in 6–8 hours by (2) a very large area of erythema with infiltration and oedema of the subcutaneous tissues. Even though the greater part of the arm be affected there is no tenderness of glands, but only an almost negligible itching and heat with slight aching.

Attention has hitherto been chiefly paid to this second stage, which is often wanting when suppuration has occurred and after operation. The author finds that more reliance is to be placed upon the primary indications, since they are given in some 90 per cent. of hydatid cases, even in those who fail to give a positive response to the complement fixation and precipitin tests. The two disadvantages of the test are, firstly, that since the fluid employed is obtained from sheep hydatids some subjects sensitive to sheep protein may give a positive reaction in the absence of hydatids; secondly, the cutaneous sensitiveness to hydatid protein may persist for years, and the test cannot be relied upon, therefore, to prove recurrence. For those patients who give a history of previous operation for this disease the complement fixation reaction is of more value for indicating residual or freshly developed cysts. A point worth noting is that the cutaneous reaction fails under anaesthesia in a considerable proportion of those who, prior to being anaesthetized for operation, gave a positive result.

From experiments carried out upon himself the author shows that the presence of free circulating antigen—hydatid fluid—does not interfere with the appearance of the primary wheal.

H. H. S.

DEW (Harold R.), KELLAWAY (C. H.) & WILLIAMS (F. Eleanor). **The Intradermal Reaction in Hydatid Disease and its Clinical Value.**—*Med. Jl. Australia.* 1925. May 9. 12th Year. Vol. 1. No. 19. pp. 471–478. [10 refs.]

This paper covers, though in greater detail, the same ground as that of Kellaway. The Casoni intradermal reaction, particularly in its early manifestation, is found to be of greater value than the complement fixation test as a diagnostic criterion in uncomplicated cases which have not been previously operated upon for hydatid, 92 per cent. yielding a positive result. A great advantage of the test is that suppuration and rupture of a cyst do not inhibit the primary reaction on which the authors lay chief stress, though the secondary phase may fail to appear. In post-operative cases the results are not to be relied upon, since the reaction may be manifest after many years.

H. H. S.

DEUSCH (G.). **Zur spezifischen Diagnostik der menschlichen Echinokokkenerkrankungen, insbesondere mittels der Intrakutanreaktion.**—*Deut. Med. Woch.* 1925. Aug. 7. Vol. 51. No. 32. pp. 1319–1320. [14 refs.]

The intradermal test was performed on nine patients with hydatid and numerous others as controls who were harbouring tapeworms, Ascaris, or Oxyuris, or were suffering from syphilis.

In all the former the reaction was positive, but in none of the controls. In three cases of pulmonary hydatid in which this test was positive complement-fixation gave negative results, and in a fourth the latter was at first doubtful, but later, *after* the intracutaneous inoculation, was positive. The intracutaneous test is, therefore, more reliable than that of complement-fixation. Of subsidiary value in diagnosis is an increase of eosinophiles after inoculation. This proved to be the rule in hydatid cases, but amongst controls it was evident on two occasions only: in a patient with *T. saginata,* and in one with phthisis who was undergoing insulin treatment for diabetes.

H. H. S.

SETTE (Nicola). **Nuovo metodo di preparazione di antigene per la intradermoreazione di Casoni.**—*Policlinico.* Sez. Prat. 1925. Aug. 24. Vol. 32. No. 34. pp. 1175–1179.

The antigen employed by the author is prepared by evaporating to dryness, in a water-bath at 70° C., 150 cc. of hydatid fluid filtered through a candle. The residue is taken up in 10 cc. of 0·9 per cent. NaCl, and to this is added 20 cc. of glycerine. For the reaction, either intra- or hypodermically, 0·1 cc. of the product is used.

Of 7 patients in whom the clinical diagnosis was hydatid, 5 were found to harbour the cysts at operation ; of the other two, one had a renal tumour, and the other had been operated upon for hydatid a year previously. Of 46 controls, that is, patients suffering from conditions other than hydatid [the text states 42, but the Table gives 46], there were two yielding a slight reaction, a case of pulmonary abscess and one of enterocolitis, while a third, suffering from cholecystitis, gave a definite positive. The last patient refused operation, so it is quite possible that a hydatid also was present here.

H. H. S.

CAMERON (Gordon) & FITZPATRICK (A. S.). **The Hydatid Cyst. The Micro-Chemical Reactions of the Hydatid Cyst Wall.**—*Amer. Jl. Path.* 1925. Mar. Vol. 1. No. 2. (Whole No. 2.) pp. 227–233. [10 refs.]

One of the authors (Dr. G. Cameron) published last year some work on the staining reactions of hydatid cysts [see this *Bulletin*, Vol. 21, p. 555]. The present paper is a further investigation into the chemical composition of various parts of the cysts by microchemical means. The subject is probably of greater interest to bio-chemists than to helminthologists or tropical practitioners, and it will suffice to give the chief of the authors' conclusions. The ectocyst of the hydatid cyst wall is rich in potassium, sodium and calcium, poor in iron, iodine, phosphates and chlorides ; the endocyst shows well-marked reactions to tests for each of these. As the age of the cyst advances the potassium and sodium salts diminish, while calcium salts, neutral and unsaturated fats, and lipoids increase ; glycogen is distributed throughout the whole of the cyst wall. Scolices microchemically resemble the endocyst.

H. H. S.

ROWE (J.). **A Case of** *Cysticercus cellulosae* **in Man.**—*Jl. Roy. Army Med. Corps.* 1925. Apr. Vol. 44. No. 4. pp. 291–293.

In view of the rarity of this infection, the author records a case admitted to the Citadel Military Hospital, Cairo.

The patient, a man aged 22, had been infected previously with *Taenia solium*, but had been cured in February, 1923. Since July, 1924, several small cysts had appeared in various situations in the subcutaneous tissues of the head, arms and trunk. On being excised they were found to be *Cysticercus cellulosae*. They were somewhat irregular in growth and distribution. When first observed they were about the size of a pea, but increased to about double this size in the course of a week, after which they were quiescent and caused no inconvenience.

T. W. M. C.

DESOIL (P.). **Considérations sur l'échinococcose alvéolaire du foie en France à propos d'un cas nouveau observé dans le Pas-de-Calais.**—*Ann. Parasit. Humaine et Comparée.* 1925. Apr. Vol. 3. No. 2. pp. 151–170. With 5 figs. [3 refs.]

This is an interesting paper giving a review of the question of *Echinococcus alveolaris.* Its limited geographical distribution is mentioned, the chief endemic focus being Southern Germany, where the disease has been designated by DÉVÉ "échinococcose bavaro-tyrolienne." The differential characters between it and ordinary hydatid are stated, in particular, the weak cuticularization of the former and its imperfect cyst-formation, absence of daughter-cysts and scarcity of scolices, its foldings and wanderings amongst the tissues owing to the thin and pliable cuticular layer, which also permits of more ready diffusion of toxin and so to greater local tissue reaction.

Hitherto, in France, only 14 cases have been reported, and of these DÉVÉ excludes all but five. One of these, the "Ferréol case," should also be excluded as the patient had lived in Bavaria before coming to Paris. The remaining four are recorded in detail, and an additional case under the author's care.

This patient had never been in any of the districts regarded as endemic foci of the condition. Symptoms first appeared early in 1918—discomfort in the right side after exertion—and progressed slowly till jaundice was noticed in March, 1923, and a swelling found in the right hypochondrium. There was weakness with considerable loss of flesh. The liver extended from 3 fingers' breadths below the nipple to the same distance below the costal margin. The blood contained 7 per cent. eosinophilia. Operation was undertaken in June, 1923, but removal of the tumour was deemed impossible, so a fragment was taken for microscopical examination. The swelling extended rapidly with increasing emaciation, and death occurred on January 2nd, 1924. Photographs are reproduced which show well the histological changes present, particularly the folding of the thin cuticular wall and its laminated structure. Post-mortem examination was refused.

In the final sections of the paper the author discusses shortly the question of diagnosis, and that of the identity or otherwise of this form with the ordinary hydatid of man.

H. H. S.

ROSS (Ian Clunies). **A Survey of Infestation with** *Echinococcus granulosus* **(Batsch) in New South Wales.**—*Med. Jl. Australia.* 1925. Mar. 14. 12th Year. Vol. 1. No. 11. pp. 253–258. With a map in text. [6 refs.]

Although Australia has long been notorious for the incidence of hydatid, little investigation has been undertaken in the last forty years to discover the extent of the infestation in man, stock and dogs. Ross has examined over 100 dogs in Sydney, with negative results. Of 50 dogs, however, from the districts in the country, where statistics showed that hydatid in man was prevalent, the adult tapeworm was found in 9; most of these dogs frequented slaughter-houses. About one-third of both cattle and sheep examined were infected with hydatid. The lungs were the seat of the cyst in 33, the liver in 12 cases.

T. W. M. C.

Collin (L.). **La sparganose oculaire en Annam.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 20–33. With 1 plate.

Collin finds that ocular sparganosis—due to *Sparganum mansoni*—is not uncommon in Annam and other parts of the Far East; and he discusses the clinical aspect of the cases which have come under his notice. He finds that it is often a serious disease which can only be treated surgically.

T. W. M. C.

Ware (Frank). **Some Parasitic Infections of Comparative Interest.**—*Jl. Comp. Path. & Therap.* 1925. June. Vol. 38. Pt. 2. pp. 89–91. [3 refs.]

This is a record of three cases of *Cysticercus cellulosae* and one of a sterile hydatid of the eye of man in India. Two of the cases of cysticercus occurred in the eye, and the third was in the brain.

T. W. M. C.

Hermans (A. G. J.). **Een zeldzame vondst in een door operatie verwijderde appendix.** [A Rare Finding in an Appendix removed by Operation.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Apr. 11. 69th Year. 1st Half. No. 15. pp. 1725–1730. With 1 text fig. [16 refs.]

The author records the finding of two ripe proglottids of *Taenia saginata* in an appendix removed from a 21-year-old female patient, who was harbouring the parasite. The author believes these proglottids to have been the cause of the appendicitis, and reviews the records wherein cestode segments, oxyuris, whipworms, ascaris, etc., are reported to have been found in the appendix, and to have given rise to appendicitis.

R. T. L.

i. Mosto (Domingo) & Bosq (Pablo). *Taenia saginata* **fixé dans un intestin humain.**—*C.R. Soc. Biol.* 1925. July 3. Vol. 93. No. 23. pp. 256–259. With 3 text figs.

ii. Neveu-Lemaire (M.) & Deschiens (R.). **Anomalie observée chez un** *Taenia saginata.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 267–269. With 1 text fig. [3 refs.]

iii. Dorward (W. Fyffe). **Multiple Infection by Taenia.** [Letters, Notes & Answers.]—*Brit. Med. Jl.* 1925. June 27. p. 1202.

i. The authors have observed a *T. saginata* fixed to the human intestine, a small portion of the mucosa having been sucked into each sucker in a manner similar to that observed in experimentally-infected dogs.

ii. A record of a peculiar malformation in a *Taenia saginata* where the free end of the terminal segment had united with the edge of the 25th, and formed a firm ring.

iii. Dorward records the case of a Bedouin who harboured 16 adult specimens of *Taenia saginata.*

T. W. M. C.

ISOBE. **On the Development of** *Taenia saginata.* **(II.)**—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. Formosa).* 1925. Jan. No. 238. In Japanese. English summary p. 6.

Continuing the subject of a former paper the author discusses the systematic position of a Taenia which he had himself harboured, and which he regarded as different from *Taenia saginata.* It is not identical with *Taenia confusa,* and the author after consulting Dr. JOYEUX is of opinion that it is a variety of *T. saginata.*

R. T. L.

JOYEUX (Ch.). *Hymenolepis nana* **et** *Hymenolepis fraterna.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 270–280. [21 refs.]

The first part of this paper is a review of the recent work of SCOTT and others on the life-cycles of *Hymenolepis nana* in man, and *H. fraterna* in the rat. Joyeux considers it proved in both cases that the life-history is a direct one, and that the mammal is its own intermediate host. In the second part he examines the evidence for and against the view that both these forms belong to the same species. He considers that a definite decision based on morphology cannot be made as, owing to methods of collection of the human form, it is impossible to say if its anatomy differs from the rat form. He considers that WOODLAND's results, instead of proving that a single species exists, show that the human tapeworm is biologically distinct from the murine, and he points out that, though a laboratory animal may be experimentally infected with a parasite, a bacterium or a virus, it does not prove that it is a natural host. In this case, *H. fraterna* can be transmitted to the rat very easily; while *H. nana* can only be established with difficulty. Joyeux is definitely of the opinion that the human species, probably originally derived from the rat, is now biologically distinct. Both forms, however, develop without an intermediate host.

T. W. M. C.

HONGO (Gen-ichi). [**On the Developmental Cycle of** *Hymenolepis diminuta* **Rud.**]—*Tokyo Igakkai Zasshi (Jl. Tokyo Med. Soc.)* 1925. Feb. Vol. 39. No. 2. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 186–187.]

The cysticercoids of the unarmed Hymenolepis developed fully in the insect host in 23 days, and in the final host in 15 days. The author used experimentally albino rats. He demonstrated also by experiment and by observation of natural infections that 8 species of insects play the rôle of intermediate host, viz., *Pyralis farinalis, Aglossa dimidiata, Tinea pellionella, Tinea granella, Paralipsa gularis, Tribolium ferrugineum,* and two other species which have not been identified.

R. T. L.

GRÖNBERG (Albert). **Ett fall av Bothriocephalus-anämi.** [A Case of Bothriocephalus Anaemia.]—*Hygiea.* 1925. July 15. Vol. 87. No. 13. pp. 497–503. With 1 text fig.

It is a curious but accepted fact that bothriocephalus anaemia does not appear to occur wherever the parasite is common in Scandinavia, but only in certain districts such as parts of Finland, and the most northerly part of Sweden.

The present case, in a man of 57 who had suffered from tapeworm for at least 20 years, came from Lulea in North Sweden. Only during the last six months were there symptoms of the pernicious type associated with some of the grave anaemias. The colour index reached as high as 1·67. After a relatively slight surgical operation his general condition rapidly got worse, and he was regarded as almost moribund. As the only chance of saving him seemed to be to cure him of the Bothriocephalus infection, and as he was too weak to undergo the cure, blood transfusion was resorted to. Twenty-four hours later he received 4 gm. *Extr. Aspidii Spinulosi* followed by 2 tablespoonfuls of castor oil in 3½ hours' time. Three specimens of Bothriocephalus were passed in the motions. Improvement began almost immediately afterwards, and in about 6 weeks the patient was discharged from hospital in excellent health and with a considerably improved blood picture. It is noteworthy that the eosinophils were never more than 3 per cent.

E. E. Atkin.

GRÜNMANDEL (Selma). **Bothriocephalus-Anämie im Kindesalter.**—*Monatsschrift. f. Kinderheilk.* 1924 Vol. 28. pp. 325–329. [8 refs.]

The case is recorded of a girl, 11 years of age, suffering from severe anaemia associated with the presence of Dibothriocephalus. The first time the blood was examined there were only 881,000 red corpuscles per cmm., with haemoglobin 18 per cent., and eosinophiles 8 per cent. Blood-transfusion brought about some improvement, but this was more rapid after a dose of 5 gm. of Ext. of Male Fern, which resulted in the expulsion of a worm 16 metres long [! even then the head was not found]. The erythrocytes rose in number to 2,500,000, and the haemoglobin to 55 per cent., a week later to 3,600,000 and 72 per cent. respectively. Infection with this worm is very rare in Breslau, and the case is recorded partly on that account.

H. H. S.

LEON (N.). **Accouplement et fécondation du** *Dibothriocephalus latus.*—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 263–266. With 2 text figs.

Leon has observed the phenomenon of copulation in a *Dibothriocephalus latus* placed in warm water immediately after evacuation. He finds that it is effected by the reciprocal superposition of two segments, when the genital pores come into contact and the cirrus is extruded. This sometimes results in the formation of the " knots " so frequently observed in the strobile.

T. W. M. C.

DE SOUZA-ARAUJO (H. C.). [In Portuguese & English.] **As verminoses nas creanças do Paraná. Helminthiases of Children in the State of Paraná.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 2. In Portuguese pp. 389–393. With 7 tables. In English pp. 395–399. With 7 tables.

In Parana, 83 per cent. of all children under 10 years old harbour hookworms, 91·5 per cent. ascaris, and 80·9 per cent. whipworms. Infections of the first two are found to decrease as the altitude increases and the temperature decreases; but no such relationship holds for Trichuris.

T. W. M. C.

DANHEIM (Bertha L.). **Studies on the Migratory Habits of Certain Nematode Larvae.**—Reprinted from *Trans. American Microscopical Soc.* 1925. Jan. pp. 14–23. With 13 figs. on 1 plate. [17 refs.]

From experiments on rats, Danheim concludes that, in general, the Ascaridae migrate through the body of the host, while the Oxyuridae (at least in the two forms from the rabbit studied) do not appear to leave the gut.

T. W. M. C.

VAN THIEL (P. H.). **De invloed van lage en zeer lage temperaturen op enkele parasitaire Nematoden.** [The Influence of Low and Very Low Temperature on some Parasitic Nematodes.]—*Tijdschr. v. Vergelijk. Geneesk. enz.* Leyden. 1925. Mar. 11. Vol. 11, No. 2. pp. 111–122. [7 refs.] English summary pp. 123–124.

Larvae of *Trichina spiralis* encapsuled in the flesh of guineapigs, when immersed in liquid air for a sufficient length of time to allow the flesh to assume the temperature of the liquid air, showed no signs of life on subsequent examination, neither were they able to bring about infection on being fed to rats and guineapigs.

Ensheathed larvae of *Ancylostoma caninum* were found all to be alive after 41 days when kept at 0° C.; after 8 months 4 per cent. of them were still alive. Under the same conditions, but under room temperature, the larvae all were dead in from 34–41 days. Larvae at ± −10 to −15° C. gave uncertain results. At −60° C. the larvae all were practically dead after 5 minutes. At the temperature of liquid air only a very small proportion of larvae showed signs of life even after an exposure of only two minutes.

The filariform infective larvae of *Strongyloides stercoralis* died in from 2–3 days when exposed to the temperature of melting ice. At −8° C. all the larvae were dead in 24 hours, at −10° C. the majority were dead after 4 hours, at −14 to −17° C. all were dead in 7 days, and all larvae were killed at the temperature of liquid air.

Four tables are given.

R. T. L.

LOW (George C.). **Recent Observations upon the Human Filariidae.**—*Jl. State Med.* 1925. Sept. Vol. 33. No. 9. pp. 415–418.

This paper, one of those read at the recent Congress at Brighton, reviews some of the later developments on the subject indicated in the title. The aims and results of the Expedition from the London School of Tropical Medicine to British Guiana in 1921 are mentioned, and the author adds some interesting observations of his own, culled from his work in the West Indies and his experience as Physician to the Hospital for Tropical Diseases. He demonstrates the need for caution in interpreting the results of the use of any special drug, since filarial embryos may be numerous on one day and few, or even absent, at a corresponding time on another. He found, as did the British Guiana Commission, that antimony injections have no effect upon the embryos in the circulating blood and *a fortiori* none upon the adults. This was proved to hold good for both *F. bancrofti* and *Loa loa.* The vaunted specific, Bayer "G. 1919," produced no beneficial results in his hands.

Attempts to invert the periodicity of *Loa* [illegible] hanging the habits of the patient were ineffectual—an [illegible] of distinction from what occurs with *F. bancrofti*

Finally, the author indicates various lacunae in our knowledge of the life-history of *F. ozzardi*.

H. H. S.

TOMURA (T.). **Statistische Betrachtungen ueber Elephantiasis endemica auf den Inseln Lyukû (Japan).**—*Japan Jl. Dermat. & Urol.* 1925. June. Vol. 25. No. 6. German Summary pp. 82–84. In Japanese pp. 485–503. With 1 chart & 3 text figs. [7 refs.]

During the period 1912–1923 there were 254 cases of elephantiasis seen at the Okinawa Hospital in Lyukû. Twenty-seven of these were studied and treated personally by the author. The interval between the first febrile attack and the developed elephantoid condition was, on an average 7–8 years. In this district the genitalia were affected in about three-fourths of the cases (76·3 per cent. of the males and 72·1 per cent. of the females). Among the author's 27 patients he was able to demonstrate filarial embryos in the peripheral blood of 5 only.

Among the 227 in whom the sex was stated, 151 were male, and 76 female, roughly 2 : 1. As regards age, 64 per cent. of the total were between 20 and 40 years, the proportion in each decade being practically the same, 32·4 and 31·6 per cent. respectively. 17·3 per cent. of those harbouring filarial embryos in their blood enjoyed perfect health.

H. H. S.

MONTPELLIER (J.) & LACROIX (A.). **Evolution de la gale filarienne (Onchocercose dermique).**—*Bruxelles-Méd.* 1921. Mar. 15. Vol. 1. No. 5. pp. 140–143. With 3 text figs. [4 refs.]

The authors state that craw-craw is definitely the result of intradermal filarial embryos and that these are the embryos of *O. volvulus*. Those presenting Onchocerca tumours are liable to violent attacks of prurigo, and examination of sections of skin taken at the time of the attack (not afterwards) reveal these embryos in the subcutaneous tissue. It is affirmed that a detailed examination of craw-craw cases will prove the presence of one or more Onchocerca tumours, and it is held that, therefore, the sudden afflux of Onchocerca embryos to the skin determines craw-craw. To this the authors apply the term " evolution of filarial itch."

H. H. S.

CASTELLANI (A.). **Observations on some Diseases of Central America.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 1. Vol. 28. No. 1. pp. 1–14. With 29 text figs. & 2 coloured figs. on 1 plate. [22 refs.]

This article contains an interesting paragraph, with some fine illustrations, on the worm nodules frequent in Guatemala, and due to *Onchocerca volvulus* (*O. caecutiens* of BRUMPT.). The eye symptoms associated with nodules are severe photophobia and signs of keratitis. In some cases the pupils are somewhat distorted, and do not react to light or accommodation, or only in a very sluggish manner. The fundi are generally normal. As the eye symptoms, in a series of

cases studied by the author, cleared up after removal of the nodule he is inclined to agree with Dr. CALDERÓN that there *is* some relationship—denied by FÜLLEBORN and others—between them.

R. T. L.

SERVICE (Stanley F.). **Loa Loa.**—*Clifton Med. Bull.* New York. 1924. Dec. Vol. 10. No. 4. pp. 163–166. [3 refs.]

Service records two cases of *Loa loa* in patients in America who had returned from West Africa in 1923. One had a worm removed six months after his first arrival in Africa. The other, who had never had Calabar swellings, showed no microfilariae; and Service considers that this supports MANSON's theory that the swelling is due to the birth of the larvae. She has now shown a rapid succession of the swellings, which does not agree with the theory that the cause is the death of the worm.

T. W. M. C.

DELAMARE (G.) & MOUCHET. **Calcification de la filaire de Médine. (Note radiologique).**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 318–319. With 1 text fig. [2 refs.]

A brief note demonstrating the value of radioscopic examination in determining residual calcified Dracunculus. Amongst 20 Senegalese riflemen so examined 4 were found to be thus infected. By repeated radioscopy the progression and retrogression of calcareous infiltration can be followed.

H. H. S.

MINISTRY OF HEALTH. **Reports on Public Health and Medical Subjects. No. 31. A Report on Infestation of the Human Subject by the Nematode Worm,** *Ascaris lumbricoides.* [COPEMAN (S. Monckton.]—20 pp. 1925. London: H.M. Stationery Office. [Price 6d. net.]

This is a record of a serious outbreak of Ascaris disease in a rural district in England. Infection was due either to the use of human excreta as manure, or else to the heavy infection in local pigs. The question of the existence of morphologically similar but biologically distinct species in man and the pig is discussed, and attention is drawn to LEIPER's suggestion that the two forms are biologically distinct—a suggestion supported by the recent work of PAYNE, ACKERT and HARTMAN (*ante*, p. 488). In addition, the pathology of the disease is considered.

T. W. M. C.

PORTER (Annie). **A Note on the Life-Histories of** *Ascaris lumbricoides* **and** *Ascaris suilla* **in South Africa.**—Reprinted from *S. African Jl. Sci.* 1923. Dec. Vol. 20. pp. 347–350. [2 refs.]

The writer finds that the larvae of the human and porcine ascarids develop in South Africa as elsewhere. Larvae of *Ascaris lumbricoides* were obtained from the lungs of an experimental rat, 26 days after feeding. Several cases of intermittent lung trouble in children are recorded; Ascaris ova were found in the stool and treatment with santonin or carbon tetrachloride was given; with expulsion of the worms the lung troubles ceased.

T. W. M. C.

Ohba (T.). **Investigation on the Presence of Ascaris-Larvae in the Urine during the Initial Stage of Infection with Ascaris.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. May. No. 242. English Summary p. 2. [In Japanese.]

Ascaris larvae, when given to experimental animals, migrate from the intestine, and may reach the kidneys. They are always to be found in the urine in heavily-infected cases. Their earliest appearance is about 15 hours after infection, and they continue to be present for about 8 to 9 days. The 5th or 6th day after infection is the period of maximum output. At the time of excretion of the larvae the urine contains also blood corpuscles in more or less considerable quantity, but albumen reaction occurs only in heavy infections.

R. T. L.

Ohba (T.). **Experimental Study on the Morphological Changes of the Blood in Infection with Ascaris.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Mar. No. 240. English Summary pp. 20–22. [In Japanese.]

Studies on the changes in the quantitative and morphological conditions during invasions with Ascaris larvae give the following results :—

1. Oligocythemia did not occur, but there were many cases of oligochromemia, and in such the condition of the animal was mostly serious and the termination usually unfavourable.

2. From the 1st to the 5th day after infection leucopenia arose in 83 per cent.—this, however, may have been the result of distributive leucocytosis—the white corpuscles were reduced to a quarter of the normal. Following the leucopenia, from about the 3rd to 9th day a temporary leucocytosis became manifest. In 62 per cent. of all cases the white corpuscles increased to more than twice the normal, reaching a maximum of 22,960. 25 per cent. of all cases showed no leucocytosis after the initial leucopenia. In 75 per cent. of the cases of leucopenia the lymphocytes were absolutely or relatively increased, the remaining 25 per cent. were both lymphopenic and leucopenic. The leucocytosis appeared as pseudo-eosinophilia. All cases which had passed the 5th to 8th day after infection showed eosinophilia. 60 per cent. of all very serious cases showed terminal leucopenia. The normal condition of the blood became restored only after 40 days. Eosinophilia persisted to the 20th or even 30th day. Essentially the same changes, though slighter and slower in character, follow the subcutaneous injection of body cavity fluid or an emulsion of Ascaris.

R. T. L.

Ogata (Seiji). **[On my Method of Extermination of the Ascarid Eggs. Communication II. Experiments on the Resistance of the Ascarid Eggs against Heat.]**—*Osaka Igakkai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. Dec. Vol. 23. No. 12. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 74.]

——. **[On my Method of eradicating Ascaris Eggs. Communication III. The Experimental Investigation on the Resistance of the Ascarid Eggs against Heat.]**—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). 1925. Feb. Vol. 24. No. 2. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 188–189.]

Testing the viability of eggs by cultivation the author found that Ascaris eggs were killed in water at over 75° C. in one second and would become positive to Sudan staining, whereas living Ascaris eggs do not stain with

Sudan III. Hot water at 70° C. kills Ascaris eggs in one second, at 65° C. it takes more than 50 seconds, at 50° C. more than three-quarters of an hour. Below 45° C. the eggs were not killed even after one hour or more. (The figures given in the earlier paper are somewhat lower.)

R. T. L.

i. SLATER (William Kershaw), with a note by WOLLARD (H.). **The Nature of the Metabolic Processes in** *Ascaris lumbricoides.—Biochem. Jl.* 1925. Vol. 19. No. 4. pp. 604–610. [5 refs.]

ii. STIVEN (H. E. S.). *Ascaris lumbricoides* **and Pigs.** [Correspondence.] —*Lancet.* 1925. Sept. 5. p. 523.

iii. CRAM (Eloise B.). **The Egg-Producing Capacity of** *Ascaris lumbricoides.—Jl. Agric. Res.* Washington. 1925. May 15. Vol. 30. No. 10. pp. 977–983. With 6 text figs. [5 refs.]

i. Slater finds that the pig ascarid is not anaerobic as was believed by WEINLAND, but that in the absence of oxygen it has the faculty of suppressing animation—even at 37° C., a much higher temperature than that associated with similar processes in other animals.

ii. About 90 per cent. of the Egyptian population in Port Said suffer from *Ascaris lumbricoides*, and the writer suggests that this may be due to the large number of pigs bred there.

iii. Cram finds from a dissection of two *Ascaris lumbricoides* that the egg content lies between 26 and 27 millions—a much lower estimate than that made by the older workers.

T. W. M. C.

MOUTIER (François). **La neurasthénie ascaridienne.**—*Jl. Méd. Français.* 1924. Sept. Vol. 13. No. 9. pp. 372–373. [4 refs.]

Moutier puts on record three cases of neurasthenia, all symptoms of which disappeared on anthelmintic treatment for Ascaris. In two of the cases a single worm was expelled, while in the other only three immature forms were found. He considers that helminths are often overlooked as causes of obscure disease, and quotes NICOLAS (1701) as saying, " one does not search sufficiently carefully for worms in an invalid ; and accordingly several persons of various ages have fallen sick from want of treatment or preventive measures against helminths, without the real cause being known." He considers that this dictum is still true, but is often forgotten.

T. W. M. C.

LABBÉ (Marcel) & DENOYELLE (L.). **Ictère et ascaridiose.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. May 7. Year 41. 3rd Ser. Vol. 49. No. 15. pp. 653–655. [8 refs.]

A woman, 20 years of age, developed jaundice rapidly. It was of the obstructive type and was generalized within four days of the first icteric tinge of the sclerotics being noticed, but was unaccompanied by any pain, rise of temperature or digestive disturbance. Spontaneous expulsion of ascarides led to temporary improvement, and further treatment with thymol led to the removal of 14 more worms, after which cure was rapid. This case differs from the majority of those recorded in that pain and fever associated with the cholangitis usually set up by the presence of these parasites in the biliary tract were absent.

H. H. S.

PFANNER (W.). **Ascaridiasis und Pankreatitis acuta.**—*Deut. Ztschr. f. Chirurg.* 1924. Vol. 187. pp. 125–132. [8 refs.]

The author describes and discusses two cases of acute pancreatitis due to Ascaris infection. In both, the onset of symptoms was very acute with abdominal pain. The first was diagnosed as acute cholangitis and cholecystitis, the second as perforated gastric ulcer. The first died 10 days after operation at which cholecystitis was found, but no evidence of pancreatitis. At the autopsy an ascaris was found in the pancreatic duct and passing to the middle of the gland. The second patient died while the anaesthetic was being administered, before the operation was begun. Post-mortem examination revealed 20 ascarides in the stomach and duodenum and 2 in the ductus choledochus, blocking the papilla of Vater.

H. H. S.

SCRIABIN (K. J.) & PASHIN (A. N.). **“ On Cases of Liver Ascaridosis in a Child.”**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. English Summary p. 122. [In Russian.]

A case is described in which there was found at a post-mortem on a child several adult Ascaris in the bile ducts, particularly in the left lobe of the liver. There were also in the tissue of the liver several abcesses in a pre-suppurative stage and in one an adult *A. lumbricoides* was found.

R. T. L.

TANKOFF (W. E.). **“ About Semiotics and Therapie of Ascaridosis.”**—*Russian Jl. Trop. Med.* 1924. No. 4–5–6. English Summary p. 121. [In Russian.]

Of four cases of infant ascariasis in the Wladimirskaia Gouvt. (North Russia) recorded by the author two were fatal. One showed, at post-mortem, an adult Ascaris in Wirsung's duct, and in the second case adult worms blocked the hepatic and cystic ducts.

R. T. L.

MAITRA (Jitendra Nath). **A Case of Jaundice showing Round Worms in the Liver and Gall-Bladder.**—*Calcutta Med. Jl.* 1925. Apr. Vol. 20. No. 10. pp. 390–391. With 2 plates.

The post-mortem findings in a fatal case of jaundice are described. At the autopsy the upper part of the intestine was seen to contain a large number of nematodes [the nature of them is not stated]. Three similar worms were present in the gall-bladder, and these were believed to have penetrated thither directly from the bowel, while others had migrated further up the bile-passages into the liver itself.

H. H. S.

WILHELMI (J.) & QUAST (Marg.). **Ueber die Verbreitung und den Nachweis der Oxyuriasis.**—*Klin. Woch.* 1925. May 14. Vol. 4. No. 20. pp. 964–967. [20 refs.]

Oxyuris eggs live only for a very short time in water and faeces, so that there is no danger from baths, etc. Flies are not important as carriers. Diagnosis from faeces removed from the rectum is unsatisfactory; better is an examination of the finger nails of children (the scrapings are washed in ·5 to 1 per cent. caustic soda, centrifuged, and examined under the microscope). An examination of the three middle fingers of children gave 61 per cent. positive results for one school. Children who bit their nails gave negative results. Examination of the nasal mucosa in a school of 25 gave four positives, three of these being children with short nails.

Wilhelmi and Quast find that adult worms live (at 37° C.) for two hours in water, two days in physiological saline, 5 days in Ringer's solution, and 9 days in alkaline bouillon which is changed every 12 hours. Ova hatch in bouillon in 14 hours; by adding 1 per cent. pepsin this period is reduced to 9 hours.

T. W. M. C.

VERNE (J.). **Réactions particulières de l'appendice iléo-caecal provoquées par l'***Oxyuris vermicularis* **L.**—*Bull. Soc. Zool. de France.* 1924. Vol. 49. p. 86.

At a meeting of the Society in February, 1924, the author showed stained sections of a child's appendix containing *Oxyuris vermicularis.* The specimens were females with immature ova. Their presence had set up inflammatory reaction with evidence of ciliation of intestinal epithelium and marked local eosinophilia. The intestine of the parasites contained ingested erythrocytes and the lumen of the appendix also contained red corpuscles resulting from bites of the worms.

H. H. S.

ASADA (Junichi). [**A Supplemental Study on the Development of Oxyuris.**] —*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*). 1925. Jan. No. 420. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 190–191.]

By experiment with the Oxyuris of man and that of the rat the author has ascertained that mature fertilized Oxyuris eggs hatch in room temperature (25°-30° C.) in 7 days or thereabouts. They also hatch in the stomach and chiefly in the upper part of the small intestine within half-an-hour to five hours. The hatched larvae do not attempt to migrate into the tissues of the body, but remain in the intestine and attain full growth.

R. T. L.

GROVE (J. S.). **The Use of Antimony and Potassium Tartrate in Trichinosis.**—*Jl. Amer. Med. Assoc.* 1925. Aug. 1. Vol. 85. No. 5. pp. 349–350. [5 refs.]

A case of trichinosis treated during the invasion stage when embryos could be demonstrated in the blood is put on record. 1 cc. of freshly prepared 2 per cent. sterile solution of antimony potassium tartrate was given intravenously, followed next day by 2 cc., and on the day after by 3 cc. Two days later 4 cc. were given. As the temperature had returned to normal and muscular tenderness had disappeared by the following day, the patient was discharged.

R. T. L.

OUDENDAL (A. J. F.). **Over slijmvlies-veranderingen door den** *Trichocephalus Dispar* **veroorzaakt.** [On Changes in the Mucosa caused by *Trichocephalus dispar.*]—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 1924. pp. 110–124. With 11 coloured figs. on 6 plates.

After reviewing the work done by previous workers on the effects of the whipworm on the mucosa of the host, the author deals with his own observations made on material obtained from the bodies of Indians and Chinese. He comes to the following conclusions:—

1. A syncytium of so-called giant cells is formed round the anterior portion of the worm: this syncytium is formed primarily by epithelial cells, but polymorphonuclear leucocytes may sometimes also be involved in its formation.

2. The parasite does not bore or tunnel into the mucosa; it remains in the superficial layers.

3. The parasite inserts its head into the lumen of a gland, and, thus fixed, it rolls itself round its longitudinal axis, and in so doing gathers round it cells from the epithelium, which cells lose their individuality, become a syncytium, and form a kind of closed groove simulating a tunnel.

R. T. L.

SAGREDO (N.). *Trichocephalus dispar* **in der Darmwand.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1925. Vol. 256. No. 1. pp. 268–274. With 4 text figs. [18 refs.]

The author, from an examination of bodies carried out soon after death, found that Trichuris is not always free in the intestinal canal, nor merely buried in the mucus, but that the worm does actually penetrate the mucosa, sometimes the head end being inserted, sometimes the tail, while occasionally the whole worm lies in a sort of tunnel in the wall of the intestine.

H. H. S.

HASEGAWA (Tokuzo). [**Experimental Studies on the Development of Trichocephalus.**]—*Fukuoka Ikadaigaku Zasshi* (*Jl. of Fukuoka Med. Soc.*). 1924. Aug. Vol. 17. No. 8. [Summarized in *Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. p. 105.]

After 28 days in the incubator at 28°–30° C. fully developed larvae of Trichocephalus were obtained. With a 30–50 day culture vigorous infection was obtained, although even a 28-day culture was infective. In the incubator the larvae lived within the egg shell for even 120 days. The eggs hatch and the larvae invade the mucosa of the small intestine in 2½ hours after feeding. They apparently enter the caecum in 70 hours after the ingestion of the eggs.

R. T. L.

DESCHIENS (R.) & TAILLANDIER (O.). **Présence de larves rhabditoïdes de** *Strongyloïdes stercoralis* **(Bavay, 1877) dans le liquide duodénal recueilli par tubage. Considérations cliniques sur l'anguillulose.**—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 525–527. [4 refs.]

Intermittent attacks of diarrhoea associated in some cases with a condition of neurasthenia are common in infections with *Strongyloides stercoralis*, but in a case under the author's care the symptoms were strongly suggestive of duodenal ulcer. X-ray examination after a barium meal showed thickening of the duodenal wall and the duodenal contents removed by Einhorn's tubage method revealed embryonated eggs and numbers of living rhabditiform Strongyloides larvae.

H. H. S.

TORRES (C. Magarinos). **Déterminisme de la libération spontanée des larves d'** ***Habronema muscae*** **(Carter, 1861), par la trompe de la mouche domestique ; importance de l'hématotropisme.**—*C.R. Soc. Biol.* 1925. June 12. Vol. 93. No. 20. pp. 33–35.

——. **L'hématotropisme des larves mûres d'** ***Habronema muscae*** **(Carter, 1861).**—*Ibid.* pp. 38–39.

——. **Sur l'habronémose pulmonaire expérimentale.**—*Ibid.* June 26. No. 22. pp. 214–216. [2 refs.]

ROUBAUD and DESCAZEAUX have shown that the Habronema of the horse can be liberated from the proboscis of the intermediate host—the house-fly—under the influence of heat and humidity. Torres shows that it will be freed spontaneously on contact with cold defibrinated horse blood , and he believes that blood and humidity may be essential conditions of release. The blood of other animals (including man) has no effect on the larvae. He finds also that larvae deposited on an artificial sore in a guineapig reach the lungs and form a nodular peribronchitis. He considers that the larvae have a definite tropism for the lungs.

T. W. M. C.

SANDGROUND (J. H.). **Observations on** ***Rhabditis hominis*** **Kobayashi in the United States.**—*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 140–148. With 1 plate. [6 refs.]

Rhabditis hominis, first recorded from Japan, and now found in America (1923), is believed by Sandground to be a free-living coprophagous species. He has found it not only in human stools, but also in the droppings of small mammals—but only when the stool was collected *without* precautionary measures to avoid contamination. Repeated infection experiments on the human subject have proved negative. A detailed account of its anatomy is given, and attention is drawn to its similarity to and differentiation from Strongyloides.

T. W. M. C.

YOKOKAWA (Sadamu). **[On the Gongylonema newly discovered in Formosa.]**—*Taiwan Igakkai Zasshi* (*Jl. of Formosan Med. Soc.*). 1924. Sept. No. 236. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 76.]

The specimen named *Physaloptera formosana* by the author in 1920 bears a very close resemblance to FIBIGER'S *Gongylonema neoplasticum,* and he re-names it *G. neoplasticum orientale.* The male attains maturity in 20 days, the female in 35 days, whereas *G. neoplasticum* takes two months to reach egg-laying.

R. T. L.

GALLAGHER (Joseph F.). **Hookworm in Porto Rican Soldiers in Panama.**—*Milit. Surgeon.* 1925. Apr. Vol. 56. No. 4. pp. 430–447. [5 refs.]

This article is very interesting, perhaps all the more so in that it is somewhat subversive of the usual tenets of the anti-hookworm enthusiasts, and should lead to considerable discussion. 90 per cent. of the rural population of Porto Rico is infected with hookworm, and the author investigated the incidence and effects of this parasite

in 203 recruits and 55 re-enlisted men. Of those coming from the towns 78·2 per cent. were infected, of those from the country, 90·2 per cent. The examination was made from direct smears of the faeces; in the event of two negative smears "a concentration method" was employed. In all, 83·5 per cent. were positive; of the recruits, 84·2, of the re-enlisted men, 81 per cent. The degree of anaemia, though an indication of the severity of symptoms, is not an index of the severity of infection ; sometimes those with many worms showed little anaemia, while others with few showed a greater degree.

The anomalies are interesting. The recruits were rated, according to their aptitude, intelligence and the results of physical tests, into superior and inferior, and it was found that of 23 men in the "superior" group 91·3 per cent. harboured hookworms and had an average haemoglobin percentage of 71·7, while of 27 men in the " inferior " group 88·8 per cent. were infected and had 72·9 per cent. haemoglobin. That is, the former, in spite of the higher incidence and lower haemoglobin, were better mentally and physically than the latter. Further tests were carried out as to strength, endurance, speed, co-ordination of muscles with eye and ear respectively (Professor KEMBLE'S tests), and again it was found that the " negative for hookworm " group came out lower than the positive.

The form of treatment adopted was that by carbon tetrachloride (since 1923 ; prior to that, oil of chenopodium or thymol was used). 3 cc. was the dose, given in gelatin capsules, followed two hours later by a purge of magnesium sulphate. Warning is given that alcohol should be avoided and preferably no other medicament at the same time, quinine being particularly mentioned.

H. H. S.

FELIX (A.). **Hookworm in Palestine.**—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary, p. IX. [In Yiddish pp. 207–211.] [3 refs.]; also in *Amer. Jl. Trop. Med.* 1925. July. Vol. 5. No. 4. pp. 291–296. [3 refs.]

Felix states that, although Palestine has never been recorded as an endemic centre of hookworm disease, he has found a number of cases in Petach-Tikvah in men who have never been out of the country. Soil pollution is not yet heavy, but conditions are favourable for the spread of the disease. The Palestine hookworm appears to be *Ancylostoma duodenale.*

T. W. M. C.

CHANDLER (Asa C.). **The Measure of Hookworm Infection in Communities.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 191–210. [18 refs.]

Chandler points out that the percentage of individuals in whose stools hookworm ova occur does not give a real guide to the severity of the infestation ; and that it is necessary to know also the degree of infection. The prevalence is measured by means of the Kofoid-Barber technique. The degree of infection is found by counting the egg output (using a modified Stoll technique). He finds that formed stools contain twice, liquid stools half, as many eggs as mushy stools. After making this correction, the number of eggs varied daily ; but if counts were made on three successive days and the average taken, the resulting figure was fairly constant. The incidence of infection gives an idea of the extent to which the community is exposed to infection: while the degree of infection is a measure of the facility with which infection can occur in individuals. Chandler proposes to unite both these factors to obtain an Infection Index. He finds this by using the formula,

$$\text{Index} = \sqrt{\frac{\text{e.p.g.}}{100} \times \%^2}$$

where e.p.g. = average eggs per gram,
and % = percentage infected.

T. W. M. C.

CHANDLER (Asa C.). **The Migration of Hookworm Larvae in Soil.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 105–108.

Chandler has made experiments on hookworm larvae in order to test the conclusion reached in America by AUGUSTINE, CORT, and PAYNE. He finds that lateral migration in soil is practically absent; but that even the light sprinkling of water on the surface is sufficient to distribute the larvae mechanically. Larvae tend to climb through coarse soil under conditions which indicate that this is due to a negative geotropism rather than to the upward flow of water. He finds also that migration up the side walls of an earth latrine is very slight indeed.

T. W. M. C.

HOPKINS (G. H. E.). **The Clayton Lane Technique used in the Field to control Hookworm Treatment.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Feb. 19. Vol. 18. No. 8. pp. 428–431.

A series of 54 specimens taken at random from the patients and staff of the Apia Hospital, Samoa, was used for comparing the relative values of the Clayton Lane and the Willis techniques. The former detected 92·6 per cent., the latter 87 per cent. For the diagnosis of the lightly infected the difference was much more marked, the former yielding a positive result in 14, the latter in 4 only, of 19 specimens.

A more extensive examination of the population was then carried out, using the Clayton Lane technique. Of 333 persons examined, 322, or 96·7 per cent., proved positive, with an average of over 70 eggs per cc. of faecal emulsion per person. These were given a mixture of oil of chenopodium (1 part) and carbon tetrachloride (3 parts) up to a maximum of 35 minims according to age and general health. Magnesium sulphate, 1 oz. in 4 ozs. water, was given at the same time. Three weeks later 309 of these were re-examined, and though 59·2 per cent. were still infected, the average number of eggs was only 10·9 per cc. After another 3 weeks a third examination was made, and 37·4 per cent. were still uncured, but the infection was much lighter, namely, one egg in 5 cc. of faecal emulsion. The investigation, however, proves that the Clayton Lane apparatus can be usefully employed in the field, the only drawback being one which is probably easily remediable—the corrosion of the aluminium arms of the centrifuge by the salt solution.

H. H. S.

SWEET (W. C.). **Notes on Methods of diagnosing Hookworm Infection and on Egg-Counting Methods.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 497–507. [7 refs.]

This paper consists of two parts. In the first the question of the relative values of the Willis, the Stoll, and the Clayton Lane methods for diagnosis of hookworm infection is considered; in the second, estimation of the degree of infection is made by the latter two methods.

For diagnostic purposes Clayton LANE's technique proved the best, giving about 1·5 per cent better results than WILLIS's, and 14 per cent. better than STOLL's. Where infection is very light the superiority of the Clayton Lane method is still greater. Of 20 specimens from persons harbouring apparently only one female worm the ratios were 75, 55 and 40 per cent. for the Clayton Lane, Willis and Stoll respectively. For ordinary infections the Willis method, being more rapid and needing no special apparatus, more than compensates for the slightly greater accuracy of that of Clayton Lane. Worm-count methods were found to be much less accurate than those by ordinary microscopic means.

In the second part of the paper a large number of figures are given as to the degree of infection of individual patients according to the character of the stools. The findings are shown to be liable to considerable individual variation, so that egg-counting methods for estimating the degree of infection will be of greater value when applied to large groups than to individuals. The author concludes by saying that "on the basis of the series of counts here reported, the Stoll method would seem to be slightly preferable to Clayton Lane's direct centrifugal flotation method, but further experience with the latter method may alter this conclusion."

H. H. S.

STOLL (Norman R.) & TSENG (Hsien-Wu). **The Severity of Hookworm Disease in a Chinese Group, as tested by Hemoglobin Readings for the Anemia, and Egg Counts for the Degree of the Infestation.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 536–552. With 1 text fig. [9 refs.]

The authors directed the carrying out of two sets of tests—egg-counts (Stoll's method) and simultaneous haemoglobin readings (Tallquist scale)—on 337 individuals in order to decide whether there is a definite correlation between them. Causes of anaemia other than hookworm infection, it was found, could be to some extent disregarded. Schistosomiasis was absent from the district whence the patients came, dysentery was not an important factor, malaria was widespread and the whole group is inferred to be "rather uniformly malarialized," so that malaria was probably the cause of the low haemoglobin values in patients negative for hookworm, and also influenced the other Hb. results irrespective of the egg-counts.

With a wealth of mathematical data it is shown that the haemoglobin values varied between 64·3 per cent. in the slightly infected (500 eggs per gm., "basis of formed faeces"), and 30 per cent. in the heavily infected (150,000 eggs or more), the hookworm-negative cases having an average Hb percentage of 66–67.

H. H. S.

GOODEY (T.). **Observations on Certain Conditions requisite for Skin Penetration by the Infective Larvae of Strongyloides and Ankylostomes.**—*Jl. Helminthology.* 1925. May. Vol. 3. No. 2. pp. 51–62. [15 refs.]

The larvae of *Strongyloides* and *Ancylostoma* differ in that the former are sheathless, the latter are enclosed in a sheath. They differ remarkably in their capacity to penetrate skin, for while the sheathless larvae of *Strongyloides* can enter skin very rapidly both downwards and upwards in a considerable depth of water, the larvae of *Ancylostoma* can only enter the skin if the layer of water is sufficiently shallow. The author relates ingenious experiments which have enabled him to emphasize the fundamental character of these biological differences.

R. T. L.

GOODEY (T.). **Skin Penetration by the Infective Larvae of** *Dochmoides stenocephala.*—*Jl. Helminthology.* 1925. Aug. Vol. 3. No. 3–4. pp. 173–176. [5 refs.]

It has recently been shown by CAMERON that the hookworm of the sheep forms an exception to the general rule that hookworm larvae penetrate the skin. Apparently the larva of another common hookworm, viz., *Dochmoides stenocephala* of the dog, has not been investigated. Goodey has experimentally proved by his "cork raft" technique not only that the larvae of this species is a skin penetrator, but that in penetrating the skin it does so without exsheathing, thus differing from the larvae of *Ancylostoma duodenale, A. caninum* and *Necator americanus,* which leave the sheaths upon the surface of the skin.

R. T. L.

YOKOGAWA (S.) & OISO (T.). **Investigation on the Life-History of Ankylostoma and** *Strongyloides stercoralis.* **On Oral Infection with Ankylostoma. [1st & 2nd Reports.]**—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. of Formosa).* 1925. Apr. & June. Nos. 241 & 243. English summary p. 1. [In Japanese.] Also *Tokyo Iji-Shinshi (Tokyo Med. News).* 1925. May. No. 2418. [Summarized in *Japan Med. World.* 1925. July 15. Vol. 5. No. 7. p. 184.]

If ankylostome larvae are given by the mouth to guineapigs, rabbits or mice, the majority penetrate into the stomach or oesophageal mucosa and take the course through the lungs, but in dogs such migration takes place only in very small numbers. The authors give an account of their experiments on dogs. These are designed to show that two different courses of migration are taken by hookworm larvae when given by the mouth. A puppy, about 40 days old, was given a dose of about 1,000 larvae of *A. caninum.* Two hours later the trachea was severed, and 51 hours after infection the animal was killed. Four larvae were found in the oesophagus, 169 in the stomach, 639 in the small intestine, but none in the lungs or other parts of the body. The great majority of the larvae were little developed, with a primordial mouth capsule. Another, slightly older dog was operated upon in the same way, then infected with about 3,500 larvae, and killed 5 days 15 hours after infection. 3,053 young worms were then found in the small intestine and, corresponding with the longer period, at a more advanced stage of development, some showing already sexual differentiation. The authors think that migration of the larvae through the lungs may be without any special meaning for their development.

R. T. L.

ROSKOTT (E. R. A. Luyke). **Stollingstijd en aantal bloedplaatjes bij Mijnworm- en Malaria-anaemieën.** [Coagulation Time and Number of Blood Platelets in Hookworm and Malarial Anaemia.]—*Herinneringsbundel Inst. v. Trop. Geneesk. Leiden.* 19[illegible] pp. 194–200. [7 refs.]

The author used Duke's method, which provides that all the observations are carried out at about the same temperature. He found that in the tropics, with blood from normal healthy individuals, there was considerable variation in the coagulation time, extending from a minimal period of 8 minutes to a maximal period of 19 minutes 20 seconds. In anaemia caused by the various tropical ailments there was also a very marked variation in the time required. Thus with tertian malaria a maximum of 23 minutes as well as a minimum of 4 minutes was obtained.

The number of thrombocytes (blood platelets) in normal blood varied from 180,000 to 460,000, with an average of about 250,000 per cmm. These two extremes both gave the longest coagulation time, 19 minutes 20 seconds and 19 minutes respectively. As a rule, in malaria patients showing parasites in the blood and possessing enlarged spleen, there was a reduction in the number to less than 200,000 per cmm; whereas in patients suffering from ankylostomiasis, but having a normal or only very slightly enlarged spleen, the number was always above 200,000 per cmm.

He concludes that there is no relationship between the coagulation time and the number of thrombocytes.

A table is appended.

R. T. L.

PEARSON (H. R.). **Hookworm Disease and the General Practitioner.**—*Med. Jl. Australia.* 1925. Mar. 28. 12th Year. Vol. 1. No. 13. pp. 314–315. [1 ref.]

A short paper of general remarks upon the subject of hookworm, with a few words telling the general practitioner how to examine for ova in the faeces. Under a plan now in operation it is hoped to obtain the help of the practitioner by prevailing upon him to send in notes of the clinical findings and the treatment adopted, so that when members of the hookworm unit examine the patients later the efficacy of the various drugs employed may be estimated.

H. H. S.

MOUKHTAR (Akil) & SEDAD. **Sur l'existence de l'ankylostomiase en Turquie.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 265–267.

The case is reported of a woman of 22 years, a native of Tireboli (Trébizonde), suffering from marked anaemia—erythrocytes 748,000 per cmm., haemoglobin 12 per cent. The stools contained 4-6 hookworm ova per field. Eosinophiles were 6·4 per cent. A little improvement occurred on treatment with thymol, but relapse followed, and within a month of her first being seen she died; the red cells then were only 500,000 per cmm. Numerous ankylostomes were found at the autopsy.

H. H. S.

TAMIYA (Teijin). **[On the Varieties of Ancylostoma and Statistical Relation between the Infection from the Female and Male Worms, as they are met with in the Village.]**—*Tokyo Iji-Skinshi* (*Tokyo Med. News*). 1925. May. No. 2421. [Summarized in *Japan Med. World*. 1925. July 15. Vol. 5. No. 7. pp. 184–185.]

The hookworms present in a farming village of Saitama prefecture, Japan, were mainly *Necator americanus*. The ratio of male to female worms was 1 : 1·3.

R. T. L.

YOSHIDA (S.) & MOMMA (K.). **[Ancylostomiasis among Miners. Communication I.]**—*Osaka Igakkwai* (*Jl. Osaka Med. Soc.*). 1925. Feb. Vol. 24. No. 2. [Summarized in *Japan Med. World*. 1925. July 15. Vol. 5. No. 7. p. 189.]

The English summary merely states that the Japanese text gives statistical figures regarding the disease.

R. T. L.

SOPER (Fred L.). **Factors which should determine the Selection of an Anthelmintic in a Geographical Area.**—*Amer. Jl. Hyg.* 1925. July. Vol. 5. No. 4. pp. 408–453. With 10 charts in text. [20 refs.]

The aims of this long contribution are worthy of all praise, namely, to show from examination as to the nature and degree of helminthic infection, from the habits and customs of the inhabitants, and the presence of concomitant diseases, what is the best drug or combination of drugs, and the optimum safe dosage to be used in any given geographical area. These points are illustrated by a report on work in the Republic of Paraguay. The matter, however, is rendered so complicated by tables and masses of figures, the confusion of which is not materially simplified by the employment of what are designated "arithlog grids," that we can do little more than abstract the author's conclusions and summary.

Infestation among Paraguayan soldiers is high. Of the worms found, over 90 per cent. were Necator, and this is ascribed to the occupation of the country by the Brazilian Army, with its heavy infection, following the Paraguayan war; Ascaris infects about 11 per cent. and Trichuris 43·4 per cent.

Oil of chenopodium and carbon tetrachloride both have a species and sex selective action on Necator and Ancylostoma, and both are more active against the former. Chenopodium is more efficient for males, carbon tetrachloride for females. Thus, in decreasing order of resistance, it was found as follows:—

Oil of Chenopodium.	Carbon tetrachloride.	Combination of 2 pts. CCl4 and 1 pt. oil of chenopodium.
Female *Ancylostoma*.	Male *Ancylostoma*.	Female *Ancylostoma*.
Male *Ancylostoma*.	Female *Ancylostoma*.	Male *Ancylostoma*.
Female *Necator*.	Male *Necator*.	Male *Necator*.
Male *Necator*.	Female *Necator*.	Female *Necator*.

If concentrated magnesium sulphate is administered at the same time as the mixed drug, the ultimate anthelmintic result is not impaired, but expulsion is delayed. 1·5 cc. of a 2 to 1 mixture in a single dose with simultaneous magnesium sulphate proved very efficient for Necator; in heavily infected areas 2·5 cc. may be given as a dose for adults. For Ancylostoma the best results were obtained with a 9 to 5 mixture (1·8 cc. carbon tetrachloride to 1 cc. of oil of chenopodium).

The worm-count method of Darling proved to be superior to the Willis or Stoll method for diagnosis, while it is indispensable for determining the degree and character of infestation, and the sex and species selectivity.

In the course of 36,000 treatments only five cases of poisoning were encountered, four alcoholics and one child heavily infected with Ascaris. Of these five two were fatal, the child dying with symptoms of intestinal obstruction.

H. H. S.

LALLEMANT (M. Avé). **De Ankylostomiasis in Manggarai en hare bestrijding.** [Hookworm Disease in Manggarai and the Campaign against it.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 3. pp. 395–411. With 7 text figs. & 1 plate.

Manggarai, the western part of Flores (Minor Sunda Islands), is a mountainous country with volcanic or limestone soil. The native population lives under primitive conditions, and has very uncleanly habits. Many families, with up to 200 or 300 individual members, live together in one house. At night the Manggarai native does not leave his house. He deposits his faeces through the bamboo floor on the earth underneath, where it is ingested by his pigs; there is not much evil smell, but the soil under the houses is moist and heavily infected with nematode larvae. The room under the house is used as a foddering place for the pigs, as a barn, and as a playground for the children.

The author found a high infection index of the natives by the single microscopical examination of samples of faeces, and serious infection of the soil under the houses (BAERMANN's method). Native coffee plantations commonly used for defaecation in daytime were also found to be infested.

Villages near the coast, consisting of small houses, were found to to be only slightly infected. Of native policemen, wearing shoes, only few were found to harbour the hookworm.

A hookworm campaign in such a district met with considerable difficulties. Some of the villages have been demolished, rebuilt with single family houses, and provided with latrines. The coffee gardens have been made less easily accessible by a fence. For mass treatment it was desirable to expel the roundworm as well as the hookworm, as the appearance of the former ensures a more dramatic effect on the native's mind. Therefore a combination of carbon tetrachloride and chenopodium oil was administered (adult dose 3–3½ cc. of the first, with 18–20 drops of the second). Of 1,000 hookworms expelled 561 were found to be Necator, 439 Ancylostoma. The results of the campaign will only become apparent after some time.

W. J. Bais.

CHANDLER (Asa C.) & MUKERJI (A. K.). **Combined Carbon Tetrachloride and Oil of Chenopodium in the Treatment of Hookworm Disease. A Report on the Treatment of 70 Cases.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 145–147. With 1 chart in text. [9 refs.]

Though this paper contains little that is new, it serves a useful purpose in summarizing our knowledge of the results of treatment of hookworm infection by oil of chenopodium and carbon tetrachloride. The figures and diagrams given are based upon 70 cases, none of them, however, heavily infected, treated by the combined drugs (60 mins. of the tetrachloride in milk ; oil of chenopodium, 15 mins. in capsule, followed in two hours by a saline purge) as compared with the results obtained by either of the drugs separately.

It is shown that carbon tetrachloride alone in 70 min. dose is best for pure Necator infection, while Ancylostoma succumbs more readily to the combined drugs. Untoward symptoms have been practically negligible. 3–4 cc. of carbon tetrachloride is found to be a perfectly safe dose, and this is not endangered by combination with 15 mins. of oil of chenopodium.

H. H. S.

O'BRIEN (Henry R.). **Successful Hookworm Control with Chenopodium—Carbon Tetrachloride.**—*Amer. Jl. Public Health.* 1925. Aug. Vol. 15. No. 8. pp. 696-699. With 3 text figs. [4 refs.]

In the campaign conducted in Siam by far the greatest number of treatments given since May, 1923, have been with a mixture composed of 40 per cent. chenopodium and 60 carbon tetrachloride. This mixture combines the efficacy of carbon tetrachloride in dealing with hookworms and the virtues of chenopodium in removing other parasites present. The dilution with carbon tetrachloride serves to lessen the discomfort of taking chenopodium as well as to reduce the cost. Chemically pure carbon tetrachloride was purchased and repurified when necessary. The maximum dosage used was 2 cc. of the mixture. The patient appeared without breakfast, and at 7 a.m. was given half a dose of the mixture. The other half was given at 8 a.m. At 9 a.m. he drank an ounce of magnesium sulphate in hot water, and was dismissed with the warning not to take food until his bowels had moved. In the case of a child of 15 years of age, or under, the dose was 2 drops for each year of apparent age, taken at one time in castor oil. Treatment was refused in cases complicated by tuberculosis, heart or kidney disease, acute conditions and pregnancy. Between May, 1923, and September, 1924, more than 225,000 individuals were treated by this routine. Only 3 deaths were reported which were, on investigation, found to have no connexion with the campaign treatment. This is a satisfactory and reassuring statement.

R. T. L.

STEVENEL. **Essais de traitement des parasitoses intestinales par le tétrachlorure de carbone en capsules. (Recherches faites dans un bataillon d'Indochinois.)**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 460–464.

By tests made upon parasitized Indo-Chinese soldiers the author attempted to estimate the value of carbon tetrachloride in capsules and the relative value of this drug and thymol in the treatment of Ascaris, hookworm, and Trichuris infections.

The mode of administration of the tetrachloride was more elaborate than is usually the case. The patients were admitted to hospital at 11 a.m., and kept on very light diet. At 4 p.m. each was given 15 gm. of sodium sulphate. The next day, at 8 a.m., the bowel was washed out with boiled water [the reason for its being boiled is not stated], and at 8.30 eight capsules were administrated, each containing 0·63 gm. of the tetrachloride, making a total of 5·04 gm., or 3·09 cc. At noon another 30 gm. of sodium or magnesium sulphate was given. At about 5 p.m. a little broth was allowed and ordinary diet was resumed on the following day.

The tetrachloride was a little more efficacious than thymol against Ascaris (68·51 per cent., as compared with 64·51); against hookworm 54·25, as against 45·90 per cent.; but for Trichuris the thymol proved by far the better, namely, 43·06 per cent., as compared with carbon tetrachloride 13·79 per cent.

H. H. S.

MACIEL (Heraldo). **Um anno de emprego do tetrachloreto de carbono no Hospital Central da Marinha.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 282–301. With 4 figs. on 2 plates. [45 refs.]

In Brazil hookworm patients are found to harbour the three types: *Ancylostoma duodenale, A. brasiliense* and *Necator americanus,* but the latter predominates. The first is found in some 6 per cent. of cases in the towns, due, it is said, to European immigrants; in the rural districts it is absent. Carbon tetrachloride was first used for this infection in 1922, and the author has met with no cases of toxic effects when using Merck's " Necatorina," that is, the drug guaranteed pure, put up in gelatin capsules. Toxicity is due to impurities, in particular carbon bisulphide and carbonyl bichloride.

During 1924, 1,508 cases were treated; 996 were given a single dose (3 cc. for adults, children in proportion), 324 required two doses and 112 three; the interval was usually 8 days. The author confirms previous investigators as to the particular efficacy of this drug for Necator and its uselessness for Trichuris infection. Ascaris occupies an intermediate position, and when this parasite is also present the carbon tetrachloride is better combined with oil of chenopodium.

H. H. S.

TRAVASSOS (Lauro). **Tetrachloreto de carbono.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 279–281. With 1 text fig.

The author employs rather larger doses of carbon tetrachloride than those in general use, namely, 1 cc. for those between 3 and 7 years of age, 2 cc. between 8 and 11 years, 3 cc. between 12 and 15 years, 4–5 cc. for those over 16 years. He uses Merck's preparation, " Necatorina," in which the pure drug is enclosed in gelatin capsules. For young children who find a difficulty in swallowing capsules he gives the drug in castor oil

H. H. S.

TAKAGI (Otokuma), TAMAKI (Shyuki), ITO (Teruhiko) & MURATA (Shiro). **[On the Efficacy of Parasitol employed for the Elimination of Parasites.]** —*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. Sept. No. 343. [Summarized in *Japan Med. World.* 1925. May. 15. Vol. 5. No. 5. p. 132.]

The authors observed that "Parasitol," *i.e.*, carbon tetrachloride, gave very good results in ankylostome cases.

R. T. L.

STENHOUSE (H. M.). **The Real Cause of Elephantiasis.**—*U.S. Nav. Med. Bull.* 1925. Feb. Vol. 22. No. 2. pp. 119–127. [6 refs.]

DELAMARE (G.) & MOUCHET. **Dermite dyschromique marginée, d'origine filarienne.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 316–317. With 1 text fig.

MEDICAL ZOOLOGY.

INDIAN MEDICAL GAZETTE. 1925. June. Vol. 60. No. 6. pp. 276–282.—**The Insect Menace.** [FLETCHER (T. Bainbrigge), SEN (S. K.), CHRISTOPHERS (S. R.), ANDREWS (E. A.), EDWARDS (J. T.), RICHARDS (P. B.), HOWARD (A.).]

There is nothing very novel in the miscellany of papers included under the above title. Fletcher emphasizes the importance of entomology to India as a country so directly dependent on husbandry. He endeavours to estimate the money-worth of the several items of damage (to crops, cattle, forests, human life and labour) done by noxious insects in India, and computes the total annual loss as equivalent to 200 crores of rupees (about £140,000,000) ; and he argues that if applied entomology saved even one per cent. of that estimated loss "such a saving would more than justify the most complete expansion of entomological work that we can possibly imagine." Sen and Edwards survey the subject from the veterinary standpoint. Christophers breaks away in speculations upon the possibility of specific interrelations in the geographical distribution of races of man, species of Anopheles, and species of malaria parasites. Andrews and Richards deal with insect pests of plants, Andrews speaking very much to the point on the necessity of considering the environment in which the pest finds its opportunity. Howard also speaks with discernment on natural resistance and resistant varieties of plants, and from that point of view hints at the insect pest as a possible blessing in disguise.

A. Alcock.

MACKIE (F. P.). **The Insect Menace.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 172–178.

There is nothing new in this admirable and comprehensive presidential address, in the prologue of which is well emphasized the enormous mortality of the Indian population from diseases transmitted by insects, and in the epilogue the necessity of a closer co-operation of the Medical Research Department and the Public Health Service.

A. A.

HEGNER (R. W.). **Medical Zoology and Human Welfare.**—Reprinted from *Science.* 1924. Dec. 19. Vol. 60. No. 1564. pp. 551–558.

In most lucid terms the lecturer unfolds the scope and bearing of pure science, as illustrated in one direction by the wondrous tale of the malaria parasites, the yellow fever mosquito, the Clonorchis, and the Japanese Schistosoma, in another direction by the weird story of the malaria treatment of general paralysis, and in still another direction by visions of untold tropical spaces purged and prepared for the increase of hygienically-minded mankind by the extermination of parasitic animals and their allies. Thoughtful and artistic revelations of this kind are a persuasive contrast to the rather lurid dumb-show of the cinematograph.

A. A.

LAMBORN (W. A.). **The Seasonal Habit of the Common Anophelines of Nyasaland, with a Note on its Relation to the Seasonal Incidence of Malaria.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 361–376. With 1 chart in text. [9 refs.]

The author's observations extended over two years, at Fort Johnston, in lat. 14° 27′ S., just south of L. Nyasa. Systematic collections of mosquitoes were made, on alternate days, three times every week; the collections made in 1923 amounted to 11,829, of which 10,418 were Anophelines, chiefly *A. costalis* and *A. funestus*, with 13 *A. mauritianus*; the total for 1924 was 20,689, of which 14,706 were Anophelines. In addition, breeding-places were visited at regular intervals.

A. costalis was observed to have a very distinct seasonal prevalence, being essentially a breeder in small pools—hollows, borrow-pits, hoof-prints, depressions by the road-side—and therefore very abundant during the rainy season and scarce in the dry season, its season of prevalence being coincident with the season of epidemic malaria. From the facts observed the author concludes that its control should be a comparatively simple matter.

In the case of *A. funestus* no such seasonal prevalence was observed; though the author emphasizes the necessity of care in applying his observations to other localities without actual study there.

A. A.

BRUG (S. L.). **De geographische verbreiding der muskieten in Nederlandsch Oost-Indië.** [The Geographical Distribution of the Mosquitoes in the Dutch East Indies.]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1925. Vol. 65. No. 1. pp. 1–8. [10 refs.]

The distribution of the Australian and the Oriental species of anopheline and culicine mosquitoes in the Dutch East Indies was studied by the author. He compiles his results in tabular form and finds no definite borderline between the two regional groups. Oriental species prevail. On the major Sunda Islands no Australian species were met with; there are few on the minor Sunda Islands, more on the Moluccas, but only New Guinea shows the Australian type from this zoögeographical point of view.

W. J. Bais.

STRICKLAND (C.). **The Mosquito Factor in the Malaria of Assam and its Prevention.**—*Proc. Assam Branch, Brit. Med. Assoc. Ann. Meeting Jorhat, 2nd Mar. 1925.* pp. 30–42.

There is in this paper nothing new in fact or principle, but nevertheless it is a valuable document, since it emphasizes and illustrates, throughout, the doctrine that methods of mosquito-control must be adapted with a nice discrimination of the several habitats of local species, if they are to be effective in the local prevention of malaria. After a few telling introductory remarks on the futility of haphazard efforts, the author singles out for particular attention 5 species of Anopheles—*umbrosus*, *culicifacies*, *funestus* (=*minimus* and *listoni*), *aconitus*, and *maculatus*—which he appears to think most dangerous in Assam, describing the characters of the breeding-places of each so that the appropriate measures of control may be applied. The principles of control are then considered individually—first, those that can be put in force without particular study, and then those that are useful and economical if employed with full intelligence, but may be unnecessarily expensive and even downright dangerous if adopted blindly: among the first are screening, keeping water-courses of all kinds clean and tidy, and filling; among the second—which can be applied only with full knowledge of the habits of the particular species aimed at—drainage, oiling, flooding (*i.e.*, converting a marsh or a confluence of streams into a lake by damming), alternative clearing or retaining jungle, and restriction of rice cultivation. Remarks on such matters as quinine prophylaxis, consultation of an experienced medical officer in selecting sites, finance, education, and that hateful subject "propaganda," conclude an essay which all planters' doctors in Assam will find very useful.

A. A.

ROOT (Francis M.). **American Anopheline Mosquitoes, their Classification and their Relation to the Transmission of Malaria.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 149–155. [United Fruit Company, Boston, Mass.]

Cp. *Bulletin*, Vol. 20, p. 458. In the author's present summary *A. quadrimaculatus*, *maculipennis*, *albimanus*, *tarsimaculatus*, and *argyritarsis* are listed as the most important malaria-carriers known; *A. crucians*, *punctipennis*, *pseudopunctipennis*, *grabhamii*, *pseudomaculipes*, *intermedius*, *mediopunctatus*, and *bellator* as of subordinate importance; and *A. nimbus*, *lutzi*, *parvus*, and *braziliensis* as suspects on epidemiological grounds. H. R. CARTER, however, gave evidence of *punctipennis* being the sole species present in two places where malaria was endemic, and of being the greatly prevalent and solely responsible species in another place where there had been a considerable epidemic of malaria; and also as to *crucians* being the only species found breeding in a considerable part of the decidedly malarious tide-water section of Virginia.

A. A.

KLIGLER (I. J.) & THEODOR (O.). **Effect of Salt Concentration and Reaction on the Development of** *Anopheles* **Larvae.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 45–49. [8 refs.]

The authors observe that *Anopheles multicolor* breeds in sea water and in salt water having a salinity of as much as 4 per cent., and they refer to other species of Anopheles which other observers have noticed breeding in sea water or in water of considerable salinity—*A. costalis*, *A. rossi*, *A. quadrimaculatus*, *A. crucians*, *A. albimanus* [which does not exhaust the list]. They, therefore, experimented with eggs and larvae of *A. elutus*, *sergenti*, and *superpictus*, and here record their observations. [They seem to have ignored all the observations that have been recorded regarding the very considerable elasticity of adaptation of aquatic animals of all kinds to changes and fluctuations in their medium—of marine forms locally adapted to fresh water, and

fresh water forms to sea water. These phenomena have interested many zoologists in the tropics, and the exhaustive survey of the Chilka Lake made by ANNANDALE, and published serially in the *Memoirs of the Indian Museum* is particularly worthy of mention.]

A. A.

NECHELES (Heinrich). **Zur Sinnesphysiologie von Anopheles.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. June 1. Vol. 29. No. 6. pp. 288–291. [2 refs.]

The title of this paper is a little bit misleading. The author's observations, made both in open and in experimental conditions, show that Anopheles (species not named) is influenced more by the moisture of the atmosphere than by heat and light. An atmospheric moisture of 75 to 80 per cent. is the optimum. A starving Anopheles will come into the light or will even rest in the sun if the moisture is suitable. Wintering Anopheles are attracted to cellars, and if the " biological moisture " is suitable they live ; but if it is not, they die. The author thinks that the hairs of Anopheles are hygrometers, so to speak, and operate upon nerve end-organs. He would have preferred to continue and extend his observations befoi publishing, but appears to have been influenced by the fact that he was working with a grant-in-aid.

A. A.

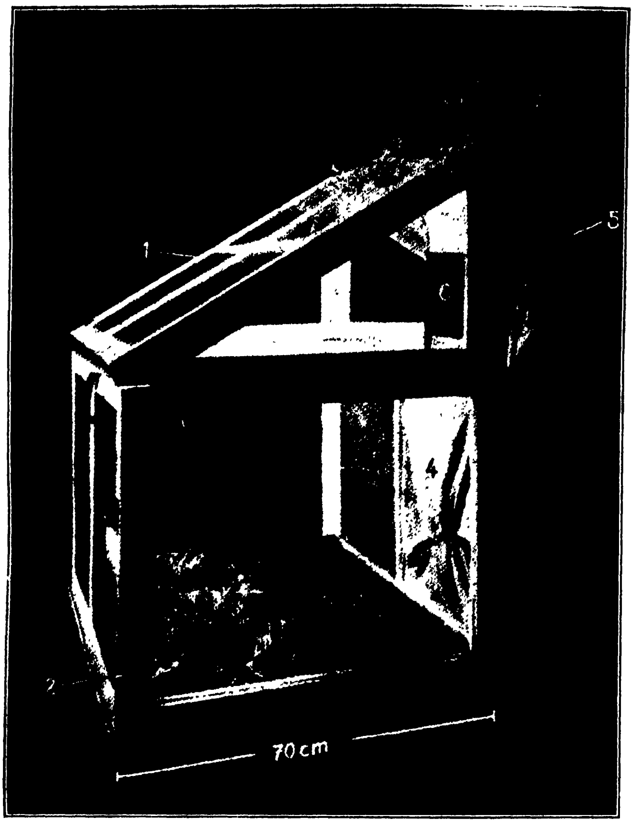
CHARRIER (H.). **Action des huiles et du pétrole sur les larves de moustiques.**—*C. R. Soc. Biol.* 1925. May 15. Vol. 92. No. 16. pp. 1280–1281.

The author's experiments confirm the facts, well known to many, though often obscured by populai error, that oil, as plain oil, kills mosquito larvae by suffocation ; that heavy petroleum kills them mainly by its toxic properties, suffocation being quite subsidiary ; and that refined petroleum acts upon them purely as a toxin.

A. A.

MARTINI (E.). **Ueber Anopheles-Zucht (mit einigen Anopheles-Beobachtungen).**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. May 1. Vol. 94. No. 7/8. pp. 452–460. With 3 text figs.

Martini complains that English writers generally are insufficiently acquainted with the authoritative literature of their subjects ; for instance, in describing recently their success in rearing several generations of Anopheles in captivity, certain English writers appear to have overlooked the fact that EYSELL, in 1912, and he himself, before that, succeeded in getting eggs from *Anopheles plumbeus* (=*nigripes*) reared in captivity. He gives a minute description and figures of his breeding-cages. The principles, of course, are to have the cages large enough to give freedom of flight, and furnished as naturally as possible with a large tray of growing grass and bowls of water and water-weed amid the grass; and he provides them with a " sleeping-room " projecting from the upper part of one side , the atmosphere of the cage obtains its indispensable moisture from the growing grass, etc., in the bottom of the cage, but the atmosphere of the "sleeping-room" must also be kept in condition, by means of a zinc roof on the outside of which are placed some pots of creeping plants. One side of the "sleeping-room," and part of one side of the main cage are of gauze with the usual sleeve.



Cage for continuous breeding of Anopheles. The special "sleeping room" and growing plants on its roof are shown at (5).

[Reproduced from the *Centralblatt für Bakteriologie.*]

A. A.

MARCHOUX (E.). **Modes divers d'hibernation de l'*Anopheles maculipennis.*** —*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 405–407.

The author states, of *Anopheles maculipennis*, that in February he was unable to find any adults in Algeria, and that in April he could find only two in Corsica. He states also that GRASSI and BINI could not find any in the winter at Fiumicino. In Corsica, however, in winter, he found young larvae. He is, therefore, of opinion that this species hibernates in the egg and the larva stages as well as in the female adult stage.

A. A.

FALLERONI (D.). [**Studio sugli "*Anophèli maculipennis*" delle Palludi Pontine.** 1924. Aug. 12. 43 pp. Recanati, Typographie Economique.).]—[Summarized in *Bull. Inst. Pasteur.* 1925. Jan. 15. Vol. 23. No. 2. pp. 87–89.]

Results of observations, continued for a year, at the anti-malaria station of Casale in the Pontine Marshes (between Rome and Naples), of the local species of Anopheles, but particularly of *A. maculipennis.* The author insists upon the necessity of an exhaustive study of these mosquitoes, and emphasizes the view that anti-malarial sanitation is an agricultural and economic question—the protection afforded by farmyard animals being the most important part of the agricultural aspect. In many marshy places these sanitary results of good farming can be obtained without any pretentious drainage schemes, the author thinks. The biology of *A. maculipennis* is treated in much detail.

A. A.

CARTER (Henry F.). **The Anopheline Mosquitoes of Ceylon. Part I. The Differential Characters of the Adults and Larvae.**—*Ceylon Jl. Sci.* (Section D. Med. Sci.). 1925. Apr. 27. Vol. 1. Pt. 2. pp. 57–97. With 7 plates & 11 text figs. [29 refs.]

This is the first of a series of articles dealing with the natural history and pathological significance of the several species of Anopheles of Ceylon. In this instalment the 18 known species (and varieties) are described succinctly and with proper emphasis of their specifically discriminative characters, both in the adult and in the larval phase. In addition there is a brief and pointed description of the superficial anatomy of the adult and the larva of the anopheline type, as a guide to the novice; and there are some excellent figures. As a whole this descriptive entomological instalment is exactly suited to the requirements of the medical officer, being full and critical yet concise and simple in method.

A. A.

RUSSELL (Paul F.). **Identification of the Larvae of the Three Common Anopheline Mosquitoes of the Southern United States.**—*Amer. Jl. Hyg.* 1925. Mar. Vol. 5. No. 2. pp. 149–174. With 5 figs. [42 refs.]

The three species are *A. crucians*, *A. punctipennis*, and *A. quadrimaculatus*. The first is distinguished from the other two by having on the dorsal surface of the 4th and 5th abdominal segments two tufts of hairs in line advance of either palmate scale. The second is distinguished from the third by having the internal clypeal hairs placed remarkably close together.

There is a useful bibliography on the subject of anopheline larval characters.

A. A.

i. STRICKLAND (C.). **On the Larvae of some Indian** *Anopheles*.—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 561–563. With 2 plates. [2 refs.]

ii. NECHELES (H.). **A Contribution to the Physiology of Anopheles.**—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary p. III. [In Yiddish pp. 171–173.]

iii. THEODOR (Oscar). **Observations on Palestinian** *Anopheles*.—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 377–382. With 3 text figs. [5 refs.]

iv. BRUMPT (E.). **Les anophèles de Corse.**—*Bull. Acad. Méd.* 1925. July 21. Year 89. 3rd Ser. Vol. 94. No. 29. pp. 811–815.

v. Christophers (S. R.). **Provisional List and Reference Catalogue of the Anophelini. Part I.—Provisional List of Species. Part II.—Descriptive Synopsis.**—*Indian Med. Res. Memoirs. Supplementary Series to Indian Jl. Med. Res.* 1924. Dec. Memoir No. 3. 105 pp.

vi. Dyar (H. G.). [**Note on Bromelicolous** *Anopheles* **(Diptera, Culicidae).**—*Insecutor Inscitiae Menstruus.* Washington, D.C. 1925. Apr. 15. Vol. 13. No. 1–3. pp. 25–27. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 91.]

vii. ——. [**Some Mosquitoes from Ecuador (Diptera, Culicidae).**]—*Insecutor Inscitiae Menstruus.* Washington, D.C. 1925. Apr. 15. Vol. 13. No. 1–3. pp. 27–31. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 91.]

viii. Sinton (J. A.) & Little (C. J. Harwood). **The Occurrence of** *Culicoides* **as an Ectoparasite of Anophelines.**—*Jl. Roy. Army Med. Corps.* 1925. July. Vol. 45. No. 1. pp. 45–47. [10 refs.]

i. The writer describes some diagnostic features of the larvae of *Anopheles lindesaii, gigas*, and *fuliginosus*, and figures some of them. He notes also that the larvae of *A. maculatus* and "*willmori*" are identical.

ii. The vital importance for Anopheles of atmospheric moisture is emphasized. "The distribution of Anopheles in a room depends on the relative moisture." The author thinks that even the hairs of the insect are sensitive to moisture.

iii. The following items may be noticed. The eggs of *Anopheles elutus* possess air-floats during autumn and winter. It is difficult, if not impossible, to distinguish between the pupae of the Myzomyia section, so variable are the supposed distinctions.

iv. The author notes of the pathogenetic species of Anopheles of Corsica that they are attracted by domestic animals—a fact "that has a great interest from the standpoint of malaria prophylaxis." His observations are here recorded in detail.

v. A useful catalogue: it includes 124 species regarded by the author as valid, and 42 varieties "such as may be supposed to be species in the making." The species are conveniently characterized in a synoptic table, apart from the synonymy.

vi. Neotropical Anopheles known to breed in Bromeliaceae are *A. cruzi* (with race *neivai*) and *A. bellator* (with race *bromelicola*).

vii. These mosquitoes from Ecuador include *Anopheles tarsimaculatus, pseudopunctipennis*, and *mediopunctatus*.

viii. This short paper includes a new instance, and a brief retrospect of previously recorded instances, of Culicoides observed feeding upon a replete Anopheles, and conjectures as to the possibility of a Culicoides becoming infected from a malariated Anopheles.

A. A.

Sinton (J. A.). **Notes on some Indian Species of the Genus Phlebotomus. Part X. Abnormalities in the Appendages of some Specimens of** *Phlebotomus.* **Part XI. The Rôle of Insects of the Genus** *Phlebotomus* **as Carriers of Disease, with Special Reference to India. Part XII.** *Phlebotomus argentipes* **Annandale and Brunetti, 1908.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 467–470. With 1 plate. [3 refs.]; Apr. No. 4. pp. 701–729. [101 refs.]; pp. 789–800. With 8 figs. on 1 plate. [20 refs.]

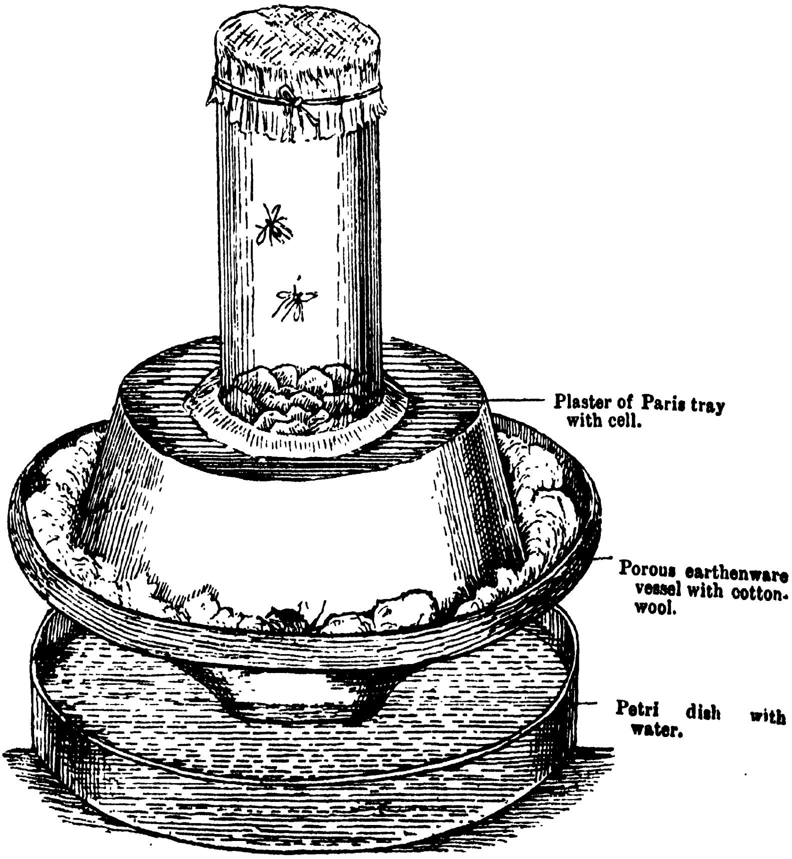
X. Notes of individual abnormalities of wing, antennae, palpi, and male genitalia in species of Phlebotomus.

XI. A comprehensive and minutely particular survey of the pathogenetic history of Phlebotomus in respect of phlebotomus fever, Oriental sore, and kala azar, as occurring in India.

XII. The author here states that the species described and figured by him as *Phlebotomus annandalei* (*Ind. Journ. Med. Res.*, Vol. 10, 1923, pp. 742–753, pl. 42) is identical with *P. argentipes* Annandale & Brunetti (1908), and he now adds some further minutely descriptive particulars of *P. argentipes* (=*annandalei*), and some details of its distribution, which does not extend beyond India and Ceylon, so far as is known at present.

The diagnostic characters of this important species are here emphasized, and the reader is referred to the anatomical figures of *P. annandalei* in plate 42 of the paper cited above.

A. A.


Plaster of Paris tray with cell.
Porous earthenware vessel with cotton-wool.
Petri dish with water.

Apparatus for breeding sandflies, showing cell prepared for oviposition.-

[Smith (R. O. A.)].

[Reproduced from the *Indian Journal of Medical Research.*]

SMITH (R. O. A.). **A Note on a Simple Method of Breeding Sandflies.** —*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 741–742. With 4 figs. on 2 plates. [1 ref.]

The following is the main part of the author's description of the method :—

" Fed females, which in almost every instance were fecundated, were secured and kept in glass tubes, till such time as all the blood in the mid-gut was digested, and the abdomen of the fly showed white, full and distended. This usually took two to three days. These flies were then transferred to another tube set on a plaster of Paris cell, in which were placed a few small stones and some crushed rabbit's faeces. The glass tube in which the flies were enclosed was only slightly larger than the hollow in the plaster cell. The cell was then placed on a rough earthenware vessel with a layer of damp cotton-wool between the plaster and the earthenware vessel. The whole apparatus was then stood in a Petri dish of water. The result of this was that moisture was drawn up through the earthenware vessel and cotton-wool to the plaster of Paris cell in just the requisite amount to favour oviposition. Since the flies had not much range of flight and choice of position, eggs laid were always found on the sides of the hollow in the plaster cell. In this position they could be left till the larvae emerged and made their way to the rabbit's faeces to feed. This method obviated the necessity of collecting the ova and placing them in another tray.

" If the material in the cell was too moist, the larvae would all be found on top, avoiding the deeper and damper layers.

" As soon as the larvae emerged, which usually occurred in about 4–7 days, the glass tube from the top of the tray was removed and a second earthenware vessel used to cover the plaster cell, for the larvae grew and thrived better in the dark. This is probably the reason why sandfly larvae are so difficult to find, as they prefer dark corners.

" As the larvae grow they require less and less moisture, till—during pupation—practically no water is required.

" Pupation took place in 12 to 14 days, and the stage of pupation usually lasted 5 to 10 days. As soon as pupation took place, the upper earthenware vessel was removed and the chimney of a hurricane lamp substituted. A piece of thin muslin was used to cover one end and the other was fixed to the plaster tray by plasticine."

A. A.

ADLER (S.). **Parasites of** *Phlebotomus papatasii.*—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary pp. IX–X. [In Yiddish pp. 211–217. With 33 text figs. [8 refs.]]

In catches of Phlebotomus in Jericho, in October-December, *P. papatasii* greatly predominated over *P. minutus* and *perniciosus.* Mites were found on one specimen and *Herpetomonas papatasii* in three others.

A. A.

BEQUAERT (J.). **Report of an Entomological Trip to the Truxillo Division, Honduras, to investigate the Sand-Fly Problem.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1924. pp. 193–206. With 1 fig. [8 refs.]

A discursive account of a field excursion. Psychodidae were observed, but the sand-flies specifically mentioned in the title were not Phlebotomus, but two troublesome species of Culicoides. [Psychodidae, of course, have no prescriptive claim to the name " sandflies "—a name which has commonly included Culicoides and even Simulium.]

A. A.

MERCIER (L.). **Diptères "buveurs de sang" et diptères "suceurs de sueur." Leur association possible dans la propagation de certaines maladies d'origine microbienne.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 135–136. [2 refs.]

The author verifies the familiar fact that certain very common flies—Hydrotaea, Morellia, and some species of Musca—are particularly troublesome to cattle [and man], not by sucking blood directly, but by persistently sucking sweat and other secretions, and perhaps sometimes taking the blood exuding from a wound made by a true blood-sucking fly. He speculates on the pathogenic possibilities of such suckers of sweat, but does not seem to have observed whether any of them possess—as do Hydrotaea, Lispa, and Scatophaga—formidable labellar teeth.

A. A.

FIJI. **Annual Medical Report for 1921. Memorandum by the Government Entomologist.** [SIMMONDS (Hubert W.).]—3 pp. [MS. received from the Colonial Office.]

ILLINGWORTH attributed a disappearance of house-flies (*Musca domestica*) from most parts of Fiji, in "about 1912," to a species of ant, which he observed carrying off the eggs and small larvae. Further observations by the present Government Entomologist (H. W. Simmonds) confirm the statement that the ant, now identified as *Pheidole megacephala*, is a very active agent in controlling the house-fly in Fiji, and that it works both in the stables and in the paddocks.

A. A.

MUZZARELLI (Erminio). **Sul passaggio di alcuni microrganismi patogeni attraverso lo intestino delle mosche carnarie.**—*Ann. d'Igiene.* 1925. Mar. Vol. 35. No. 3. pp. 219–228. [7 refs.]

The object of the experiments detailed in this paper was to find out whether organisms ingested by fly larvae were still viable after passing through the intestine, whether those ingested in the larval stage persisted in the imago, and, finally, whether, if this were so, the organisms might be transmitted to the succeeding generation. The author first determined the microbial flora of the larval intestine and then allowed the larvae to feed on meat plentifully strewn with certain bacteria, such as *B. pyocyaneus*, an acid-fast streptothrix, a pathogenic blastomycete, etc. He found that pathogenic organisms lose their pathogenicity by such passage, and that organisms, when ingested by the larvae, do not persist to the adult stage. The third point, therefore, did not arise.

H. Harold Scott.

STRICKLAND (C.) & ROY (D. N.). **The Infection of** *Lucilia caesar* **with** *Herpetomonas.*—*Parasitology.* 1925. May. Vol. 17. No. 2. pp. 168–169.

The authors conclude that the flies do not transmit their infection of Herpetomonas to the ovum. Larvae are easily infected from food contaminated by parents. An infection acquired by the larva is largely or completely lost in the course of attaining the adult stage. Adult flies easily acquire infection whether or not the larvae has been infected. Outside the body of the fly the Herpetomonas can survive at least 18 days.

A. A.

SWYNNERTON (C. F. M.). **An Experiment in Control of Tsetse-Flies at Shinyanga, Tanganyika Territory.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 313–337. With 14 figs on 7 plates, & 1 map.

The author of this paper is one of those who, having lived in the jungle and thought about the jungle, has come to realize that in any great zoogeographical province the whole living creation—animal and vegetable and man himself included—is mutually bound together by intricately-intersecting natural ties of dependence, or, one might almost say, of commensalism ; so that if at any point the nexus galls him, man must get ease, not by trying to cut the knot, which only makes things worse for him, but by carefully studying the organic environment.

The following items from the summary of the author's observations for the control of tsetse-flies at Shinyanga in Tanganyika Territory are of general interest :—

" Shinyanga is divisible into : (*a*) Thorn-bush country containing plenty of tsetse, but no population . . . (*b*) Open grass-land, produced in the past from the thorn bush by the settlement in it of people in sufficient numbers to clear it and keep it clear through their cutting for firewood and building and the browsing of their stock.

" Except in one respect the position in the open country is ideal. There is complete segregation of tsetse and people, and a situation exists in consequence amounting, for practical purposes, to control of the tsetse. . .

" The exception is this. The tree roots still survive in the open country and, whenever population thins for a time, shoot up into bushes and trees. Where these are adjacent to tsetse bush, the fly is carried into them, while they are still small, on persons passing to and fro, and cattle begin to die. The people then fall back, allowing new bush to spring up and the process to be repeated. This retreat and the reconquest by fly has been for some time at the rate of a mile a year, and new " fronts " have been formed, so that the cattle-areas are now nearly surrounded.

* * * * *

" The remedy is in the hands of the people themselves. They have merely each year to combine to cut back the young shoots and the bush and the tsetse cannot advance. And persons must not allow the flies to travel on them into cleared areas.

" But the retreat, and natural increase of stock, have caused congestion of the cattle in the areas still populated, with severe shortage of grazing, and deaths ; and the destruction of grass has led to erosion and serious loss of soil. The remedy is again easy. When the people come out each year to cut back the young shoots, they should take the opportunity to clear for some little distance into the bush and so get enough grazing. Also, any new agriculture likely to demand much ground, and so still further to reduce the grazing, should be located so far as possible in the fly-bush . .

* * * * *

" A small, typical, infested block of the fly-bush has been cut off by clearing and an experiment initiated : (*a*) In inducing natives to settle in the barrier, so as to widen it automatically and keep it clear ; (*b*) in clearing the block itself of fly ; and (*c*) in testing the width of barrier which, combined with such precautions as may prove of use, will prevent the block from becoming reinfested from the main bush. The initial response to the inducements offered has been good.

"The first step towards breaking up the fly-belt on a greater scale has been taken by clearing, to a width of 400 yards on either side, a road traversing a point at which the fly-belt narrows to seven miles. It is planned to make (and greatly widen) further breaks, and to attack in detail the blocks broken off, should it prove difficult otherwise to prevent reinfestation of country that may be cleared of fly by grass-burning etc.

"Felled bush continued to harbour fly for some time, at any rate, if people and game continued to wander between it and the bush as yet unfelled. Complete destruction of the timber by twice piling and burning it made it uninhabitable by fly, but if time is of no account, the bush can lie till the twigs and small branches of it are warped downwards into a closer mass by the next rains, and so are destroyed by the grass fires of the following year.

"A direct prohibition, enforced by a patrolling guard here and there, reduced nearly to nothing the carrying of flies into cleared or cattle country by man. Game wandered in and out almost entirely at night. The stationing of a pair of fly-boys on a road with nets, combined ultimately with dark shelters alongside for the attraction of the flies, was most useful during an entire year in preventing the carrying in of flies by cars and wayfarers. The attachment of brown paper smeared with "rat varnish" to the hoods of cars and the backs of natives was useful in destroying flies frequenting a road.

"Mere cutting of tsetse bush is useless, for it springs again, so that it is futile to try to gain ground by this means faster than we can consolidate it. The following measures for the consolidation of clearing are being tested now in Shinyanga: The introduction of native settlement to keep the ground clear automatically; the special cutting down once or twice a year by each village of the new shoots for a few hundred yards round; the encouragement of the keeping of goats; the diversion of large scale agriculture by ploughing, which entails stumping, to the clearings it is wished to consolidate; the digging up of stumps by the natives for firewood; and the killing of trees by poisons and particular forms of ring-barking.

"The annual postponement of the grass fires till October, and then lighting them on an organised plan . . . In 1921, I carried out a successful experiment near Kilosa. Father Cirvegna took up the organisation of the measure over a small piece of fly-belt at Madibira, in the Iringa district, and there seems to be little doubt that he has cleared the area of fly by means of it in three burnings.

"A large scale experiment by myself this year in the Nzega and Shinyanga sub-districts seemed to show: (*a*) That by means of native guards, each with an area, and some aid from the headmen, it is perfectly possible to preserve a great piece of country nearly unburned; (*b*) that the late grass fire, lighted on a broad front with a good wind and followed up by the burners, produces, when the grass growth is sufficient, a "drive" of the flies on the wing; these then become congregated in enormous numbers beyond the limits of the fire and in any appreciable patches of ground which escape it; (*c*) that in these places, by the prompt use of nets and bird-lime, it is possible nearly to exterminate the congregated flies . . . (*d*) that far more numerous breeding thickets and breeding logs are destroyed by such a fire than by an earlier or ill-organised fire, and that with the expenditure of some labour in the littering with dry grass of thickets and logs unlikely to be burned otherwise all may be burned, or many may be cleared by hand; (*e*) that a much larger percentage of dead pupae (52 per cent. in this case) may be found afterwards in breeding places thus burned through than in those that are not burned (9 per cent.).

"Some of these indications merely confirm results previously obtained by me in Rhodesia and Tanganyika; others need to be confirmed by means of further experimentation. Meantime, combined with Cirvegna's result, they suggest that late organised grass burning is likely to be of value over the very considerable areas in Africa in which the grass and the dry season are long and organisation is possible. But even if this should definitely prove true, means of preventing reinfestation must be studied, for these may turn out to be a serious difficulty.

"The relations of the fly and the game are not being ignored . . .

"This scheme amounts to an attempt to destroy and control tsetse by means of agencies and resources already in existence and merely requiring to be diverted specially to that purpose and organised, and by enlisting the co-operation of the people themselves who are to be aided and protected. This is both the most practical way of dealing with the problem and the way that best accords with the sound policy of educating the natives to understand and attack their own problems and advance themselves through their own efforts."

A. A.

SWYNNERTON (C. F. M.). **The Tsetse-Fly Problem in the Nzega Sub-District, Tanganyika Territory.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 99–109. With 6 figs. on 3 plates.

The district in question—an illustrative one—contains: (1) "Old" savannah forest (mostly Brachystegia); (2) "younger" savannah, which appears to be cleared land that has gone back to jungle as the result of depopulation from inter-tribal war; (3) open uninhabited "grassy steppe"; and (4) open settled land. The "old" savannah is inhabited by *Glossina morsitans* and *swynnertoni*, which are advancing through the "younger" savannah and threatening the settlements. To meet the threat the author advocates properly planned and supervised late burning. This regularized burning would replace the promiscuous grass fires immemorially practised, which only lead to the subsequent spread of thicket that encroaches on pastures and shelters tsetse and eventually is extremely difficult to clear. The tracts, carefully chosen and burnt late in the season by someone who understands the business and is not distracted by other duties, would be stocked with a view to future settlement. The author's experience is against attempting to exterminate game, mainly on the ground that it diverts the population from the settled husbandry that checks the spread of tsetse, to hunting, which drives the game to and fro between fly-infested and fly-free tracts, and tends to spread the tsetse.

A. A.

GOLD COAST. i. **Report of a Brief Visit made to a Tsetse Area to obtain some Idea as to the Setting up of a Camp to Investigate Tsetse Flies as has recently been done in Nigeria.** [YOUNG (W. A.), Act. Director Med. Res. Inst., Accra.]—5 pp. F. cap.

ii. **Second Report on Tsetse Fly and Trypanosomiasis (in Response to Secretary of State's Despatch No. 630, 1923).** [YOUNG (W. A.), Director, Med. Res. Inst., Accra.]—6 pp. F. cap. [Unpublished Reports enclosed in Despatches No. 359 dated 1st May, 1924, & No. 110 dated 19th Feb., 1925, from the Governor of the Gold Coast to the Secretary of State. Received from the Colonial Office.]

These two reports give the results of two expeditions to the tsetse-fly country of northern and north-western Ashanti. The first expedition was made at the end of the dry season just at the onset of the early rains; the other at the end of the rainy season. In the course of the first (dry season) expedition, tsetse-flies (*palpalis, tachinoides,* and *longipalpis*) were certainly observed in the places indicated on the existing spot maps, but they were everywhere very scanty, and, although the writer and his companion were once bitten (by *palpalis*, and in the darkness, before even the peep of dawn), they could bathe in the Volta river without being touched. A few flies were dissected, but they did not contain trypanosomes. Cattle and horses and donkeys were seen, and the natives, although they knew the tsetse-fly, knew nothing about sleeping sickness.

The contrast at the time of the second (end of rainy season) expedition was remarkable. *Glossina palpalis* was common on every stream and in some places very plentiful. *G. medicorum* was also found as well as *tachinoides* and *longipalpis*. Pupae of *tachinoides* were discovered, and (once only) of *palpalis*. Many flies were dissected; infection with *Trypanosoma congolense* was several times observed, and one *palpalis* was "potentially infected" with *T. gambiense*—*i.e.*, freshly imbibed blood containing that species was found in its gut. Trypanosomiasis was definitely observed by blood examination among the natives, but in only two of the cases did the patients show any symptoms of illness. The conclusions of the second report are that sleeping sickness is by no means a rare disease in Ashanti, but it is undoubtedly chronic, and probably many spontaneous recoveries take place.*

A. A.

PORTER (Annie). **Notes on some Insect Larvae that may occur in Man in South Africa.**—Reprinted from *S. African Jl. Sci.* 1924. Nov. Vol. 21. pp. 373–377. With 8 text figs.

Notes on cases of myiasis observed by the author in S. Africa. They include the finding of about 200 maggots of *Sarcophaga magnifica* in an old wound; of 3 maggots of another species of Sarcophaga in the nasal cavity; of maggots of *Calliphora croceipalpis* in one case in the ear, and in another case in a fresh-passed stool; of maggots of *Stomoxys calcitrans* in the neglected foot of a stable-boy; and of maggots of *Musca domestica* in fresh-passed stools on several occasions, and in one instance in a sore in a neglected child. In the last case the patient was a white child; in all the other cases the patients seem to have been natives. The occurrence of *Cordylobia anthropophaga* in S. Africa is also mentioned.

A. A.

PATTON (W. S.) & COOKSON (H. A.). **Cutaneous Myiasis in Man caused by** *Musca domestica.*—*Lancet.* 1925. June 20. p. 1291. With 1 text fig.

In this case—a patient of over 80 years—the maggots were those of the common housefly and although they caused some inflammation and thickening and abrasion of the skin, they did not cause much discomfort or any extensive destruction. They were observed at first emerging from a small hole or ulcer near the ankle and they continued to emerge at intervals for about six months.

A. A.

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* Dr. WADE, who reported in 1911 on KINGHORN's Ashanti cases (Western Province) about a year after his visit found that of the 97, 41 were dead, 9 still ill, 29 in good health, and 10 not traceable. The percentage of deaths is high. [*Sleeping Sickness Bulletin*, Vol. 4, pp. 128–9.]—A. G. B.

RIBADEAU-DUMAS (L.) & LARROUSSE. **Myiase cutanée.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. May 21. Year 41. 3rd Ser. Vol. 49. No. 17. pp. 750–756. With 1 text fig. [13 refs.]

This paper, which does not contain anything new, is based on a case of *Hypoderma bovis* myiasis, exhibiting the usual puzzling symptoms, in a little girl. It began with pain and stiffness, followed by swelling, in the nape, and then during the following two months swellings appeared successively on the chin, face, brow, and scalp, until finally a painless swelling about the size of a walnut formed on the sinciput; in the course of a week this opened, emitting a sero-purulent liquid, and disclosed a larva at the orifice. It appeared that the child had been living at a farm about four months before the trouble began.

A. A.

HERMS (W. B.). **A Case of Human Myiasis caused by the Ox-Warble, *Hypoderma bovis* de G.**—*Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 149–150. [2 refs.]

Case of infestation with larvae of *Hypoderma bovis.* The patient, a cowboy, was accidentally exposed during sleep. A few days later pain and swelling occurred in the right groin and crept about extensively over the body until it became localized in the shoulder; and from this localized swelling, about 4 months after the original exposure, a larva was forced out in the course of some muscular exertion. About six months after this another hernia-like swelling occurred in the right thigh, and from this a second larva emerged in circumstances which permitted its specific identification.

A. A.

ANDRÉ (Émile). **Sur un cas de myiase cutanée chez l'homme.**—*Parasitology.* 1925. May. Vol. 17. No. 2. pp. 173–175. With 3 text figs. [6 refs.]

Description and figure of a young larva identified as *Hypoderma bovis,* taken from a child. The larva had penetrated the skin behind the ear and had continued its development there, without wandering.

A. A.

LANFORD (J. A.) & WARNER (C. M.). **Human Myiasis due to Ox Bot Fly Larvae** (*Hypoderma lineata*).—*New Orleans Med. & Surg. Jl.* 1925. May. Vol. 77. No. 11. pp. 473–474. [3 refs.]

The patient in this case was a white child of 22 months, having a slight swelling of a testicle which, after four months' duration, suddenly became increased and acutely tender. Three larvae of *Hypoderma lineatum* were found in the tunica vaginalis.

A. A.

IRVINE (A. C.). **Intestinal Myiasis.**—*Kenya Med. Jl.* 1925. May. Vol. 2. No. 2. p. 51.

Case of a native teacher of 24 years who on several occasions during a term of 4 months passed maggots of a species of Sarcophaga (which the author identified as *carnaria*) and also stated that he used to pass maggots in his stools when he was a small boy. The author does not state that the case was specially investigated under hospital conditions, and indeed, he appears to be aware that the evidence here reported is not strong enough to support any particular one of several theories of causation that might be suggested.

A. A.

i. Frison (Theodore H.). **Intestinal Myasis and the Common House-Fly (*Musca domestica* Linn).** [Abstract.]—*Jl. Econom. Entom.* 1925. Apr. Vol. 18. No. 2. pp. 334–335.

ii. Newstead (R.) & Potts (W. H.). **Some Characteristics of the First Stage Larva of *Dermatobia hominis* Gmelin.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 247–260. With 2 plates. [20 refs.]

iii. van Thiel (P. H.). **Over het voorkomen van de larve van *Dermatobia hominis* L. bij den jaguar.**—*Herinneringsbundel Inst. v. Trop. Geneesk Leiden.* 1924. pp. 138–152. With 2 figs. on 1 plate. English Summary pp. 149–150. [19 refs.]

iv. Forsius (R.). [**Ueber einen in Finland beobachteten Fall von Fanniasis (Myiasis) intestinalis. A Case of Intestinal Myiasis observed in Finland.**]—*Notulae ent.* Helsingfors. 1925. May 8. Vol. 5. No. 2. pp. 50–53. [Summarized in *Rev. Applied Entom.* 1925. July. Vol. 13. Ser. B. Pt. 7. p. 102.]

v. Greene (Charles T.). **The Puparia and Larvae of Sarcophagid Flies.**—*Proc. U.S. Nat. Museum.* 1925. Vol. 66. Art. 29. pp. 1–26. With 9 plates. [1 ref.]

vi. Tibaldi (E.). [**Miasi intestinale da *Sarcophaga Bekeri.* Intestinal Myiasis from *Sarcophaga bekeri.***]—*Boll. soc. med.-chir. di Pavia.* 1924. Vol. 36. p. 365. [Summarized in *Med. Sci. Abstr. & Rev.* 1925. Apr. Vol. 12. No. 1. p. 64.]

vii. Lapie (G.). [**Venomous Caterpillars and the Urticarial Affections produced.**]—*Les Chenilles Venimeuses et les Accidents Eruciques. Paris: Libr. Sci. Nat.* 1923. 191 pp. With 4 plates. [Summarized in *Experiment Station Record.* 1925. Mar. Vol. 52. No. 4. p. 358.]

i. Case of half-grown larvae of *Musca domestica* passed, both per os and per anum, by a boy convalescent in hospital. Dr. L. O. Howard spoke of scores of cases of intestinal myiasis by this species correctly identified at the Washington Bureau during the last 10 or 12 years.

ii. A description and figure of the first stage of the larvae of *Dermatobia hominis*, with an appropriate introduction on some habits and hosts of the fly.

iii. Records the finding of larvae of Dermatobia in the skin of a jaguar in Surinam agreeing in all particulars with larvae of *D. hominis* found in man in Rio de Janeiro.

iv. Maggots identified as *Fannia scalaris.*

v. Descriptions and figured details of 41 puparia and 5 larvae of 41 species of Sarcophagid flies.

vi. The substance is summarized in the title, excepting the fact that the patient had previously been infested with *Taenia saginata.*

vii. Treats comprehensively of venomous and urticating caterpillars.

A. A

Hirst (L. Fabian). **Plague Fleas, with Special Reference to the Milroy Lectures, 1924.**—*Jl. of Hyg.* 1925. July. Vol. 24. No. 1. pp. 1–16. [15 refs.]

In January, 1912, the author collected several hundred fleas from the rats of Colombo and sent them to Rothschild, who pronounced them to be of a new species, *Xenopsylla astia.* Up to that time Colombo had been free from plague, although there was no evident natural reason for its immunity. (*X. cheopis* was not found in Colombo until January, 1914, immediately after the introduction of plague in cargoes of rice from Negapatam, and in the latest surveys here reported *X. cheopis* was strikingly abundant in just those parts of Colombo where the incidence of plague was heavy on rats and men, and was correspondingly infrequent elsewhere.)

In 1913 the author discovered that the rat-fleas of Madras—a city which, although plentifully infested with rats and not possessing any obvious natural peculiarities, also enjoyed remarkable immunity from plague—also were of the species *X. astia.*

These remarkable coincidences led him to surmise that light would be thrown on the epidemiology of plague by investigating the geographical distribution of *X. astia* and *cheopis*, and by comparing the natural capacity of the two species as carriers of the plague bacillus.

CRAGG followed the matter up some years later in India (see this *Bulletin*, Vol. 19, p. 490), and in his extensive survey of Indian rat-fleas struck some remarkable instances of the freedom from plague of areas where the only rat-flea found was *X. astia*, and on the other hand, of the heavy incidence of plague where the prevalent species was *X. cheopis.*

As regards the comparative efficiency of the two species in Colombo, experiments already reported by the author had impressed him with the superiority of *X. cheopis*, and he now gives the bare results of further experimentation since 1921 which fully confirm that conclusion. Using 596 *X. astia* in a series of 13 experiments during 4 plague-seasons, he could not get a single transmission at room temperatures, although he did succeed in getting a transmission when the temperature was reduced (with help of ice) to about 70° F. On the other hand, using 132 *X. cheopis* in a series of 6 experiments, he transmitted plague to 12 rodents at ordinary temperatures. Several *X. astia* were found " blocked " with plague bacilli, but they could not be kept alive long or be got to bite; though a " blocked " *X. cheopis* was kept alive at least 15 days at an average temperature of 85° F.

The author attributes the superiority of *X. cheopis* largely to the circumstances that it feeds at longer intervals and bites much more persistently, and that it survives longer when " blocked."

His main general conclusions are: That "*X. cheopis* is the most effective transmitter of both epidemic and epizootic bubonic plague in all parts of the world " ; and that the relative immunity of certain parts of India and Ceylon from plague is mainly due to prevalence there of *X. astia*, an inefficient plague-carrier, and only secondarily to climatic conditions. He believes that *X. astia* must have been the aboriginal rat-flea of India; that *X. cheopis* is a species of later introduction, by sea-borne trade, from which species the plains of Madras to some extent have been protected by mountain chains; and that unless precautions are taken, this most effective transmitter of plague will become established along the whole seaboard of Madras—with results.

In an interesting discussion on imported plague, the author emphasizes as a particularly dangerous attribute of *X. cheopis* that its larvae can be readily reared, quite independently of rat nests and of indirect assistance from parent fleas, entirely on the debris of grain, and so are peculiarly amenable to transportation in grain-ships.

A. A.

WILLIAMS (C. B.). **The Seasonal Prevalence of Fleas in Egypt.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 353–355. With 2 charts in text.

During three years' residence near Cairo the author has observed the seasonal occurrence of the fleas that trouble man there. They all have been *Pulex irritans*. In July-September they are very rarely seen; during October one or two may be seen, and they are still rare until the end of January, when there is a rapid increase up to a maximum in March-April, and then a fall to the rarity of July. The great increase of fleas thus occurs in the spring, when the temperature is rising and the humidity falling.

A. A.

DELANOË (P.). **Au sujet de la détermination spécifique des puces provenant des indigènes marocains. (Pour servir de contribution à l'étude de la Peste au Maroc.)**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 149–152. [2 refs.]

Every single one of several thousand fleas caught by the author in the years 1920–1922 on native Moroccans was *Pulex irritans*. Of 71 fleas taken by him from a casually-killed jackal black with these insects, 62 were *P. irritans*, 8 were *Ctenocephalus canis*, and 1 was a species that the author hesitates to place with Xenopsylla. From these and other observations the author concludes that *P. irritans* is the predominant flea of Morocco, and in that conclusion sees an explanation of the facts that in the Dukkala epidemic of 1912, (*a*) SACQUÉPEE and GARCIN could only exceptionally find an infected rat, and therefore inferred that infection was spread from man to man; and (*b*) infection was at once stayed by general anti-plague vaccination, and has not re-appeared. A report on the rodent fleas is promised.

A. A.

SUKNEV (V. B.). **[Organisation and Results of Observations in the Transbaikal Endemic Plague Region in 1923.]**—*Transbaikal Govt. Dept. Health Protect.* Chita. 1924. 80 pp. With 9 plates, 6 figs. & 1 map. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 85.]

The summary deals chiefly with the ectoparasites of the marmot *Arctomys bobac*, reputed to be the main source of plague in Transbaikalia. The ectoparasites specified are *Ceratophyllus silantievi*, *Rhipicephalus haemaphysaloides* (?), and lice. None of these parasites taken from infected marmots proved infective, nor were emulsions of Ceratophyllus infective except in an instance where the flea contained fresh (infected) blood, though emulsions of the lice are said to have been infective. Confidence in these experiments is not strengthened by the statement that they were not extensive enough to be considered decisive.

A. A.

i. URIARTE (Léopold). **Pulicidés des rats de Buenos-Aires.**—*C.R. Soc. Biol.* 1925. Mar. 20. Vol. 92. No. 10. pp. 831–832. [2 refs.]

ii. PEMBERTON (C. E.). **[The Rat Control Problem.]**—*Rept. Comm. Expt. Sta. Hawaiian Sugar Planters' Assoc.* 1924. pp. 25–26. Honolulu, 1925. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 86.]

iii. JORDAN (K.). **[Siphonaptera collected by Rear-Admiral H. Lynes in Darfur in 1920 to 1922.]**—*Nov. Zool.* Tring. 1925. Apr. 30. Vol. 32. No. 1. p. 113. [Summarized in *Rev. Applied Entom.* 1925. June. Vol. 13. Ser. B. Pt. 6. p. 86.]

i. At the present moment, as 20 years ago, the prevalent rat flea in Buenos Aires is *Xenopsylla cheopis* ; on "a large number" of rats (*M. decumanus, rattus,* and *alexandrinus*) 123 fleas were caught, of which 119 were *X. cheopis*, 3 *Ctenocephalus felis*, and 1 *Pulex irritans*, and five *X. cheopis* were caught from two rats from Santa Fé.

ii. Of nearly 3,000 fleas caught on dogs and cats in Hawaii not one was a rat flea.

iii. *Xenopsylla cheopis* was one of the species captured in Darfur.

A. A.

DELANOË (P.). **A propos de la puce du porc. Le porc hôte électif de la puce de l'homme. (Pour servir de contribution à l'étude de la peste au Maroc.)**—*Bull. Soc. Path. Exot.* 1925. Feb. 11. Vol. 18. No. 2. pp. 191–199. [7 refs.]

ROUBAUD insists that mammals that have a naked skin, and particularly pigs, are attractive to human ectoparasites ; the author confirms the observation of BISHOPP that this is certainly so in the case of the human flea, *Pulex irritans*. In Morocco he has caught many hundreds of this flea in piggeries, and even in abandoned pig-sties, and in most of his instances it was the only species observed there. He, therefore, thinks that raising pigs in Morocco is a dangerous business, and ought to be supervised and controlled, seeing that *Pulex irritans* can transmit plague ; and that by proper management the pig might be made use of for controlling the flea.

A. A.

ROUBAUD (E.). **Une nouvelle espèce de puce-chique pénétrante parasite des rats en Chine** : *Dermatophilus lagrangei* **n. sp.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 399–405. With 1 plate & 6 text figs. [1 ref.]

The species of Tunga (=Dermatophilus) here described comes from Shanghai, where it was found parasitic in the ears of a sewer rat (*Mus decumanus*). Only the female was available for description, and the specific characters emphasized are the absence of eyes and the curious form of the gravid abdomen, in lobules at the anterior end of which the head and thorax are embayed.

[In comparing this species with other species of Tunga (=Dermatophilus) and in describing it as new, the author has overlooked the eyeless species, found by BLANDFORD, in the ear of a sewer rat at Ningpo in China, and described by JORDAN and ROTHSCHILD, in 1921; as *Tunga caecigena* (see this *Bulletin*, Vol. 18, p. 205). The unique specimen of *T. caecigena* is a fragment, consisting only of a head (complete) and a thorax with a single leg ; but the figure of the head and its appendages is suggestively similar to the same parts of the Shanghai chigger figured, though rather roughly, in the present paper.]

A. A.

v. JETTMAR (H. M.). **Beiträge zum Studium der Pest unter den Insekten. I. Mitteilung. Die Tarbaganlaus.**—*Ztschr. f. Hyg. u. Infektionskr.* 1925. June 6. Vol. 104. No. 4. pp. 551–568. With 2 text figs. [32 refs.]

This is a long account of laboratory observations of the tarbagan-louse (*Linognathus* sp.), from which the following significant conclusions may be cited :—

Though the tarbagan-louse does not attach itself to an animal of another species for any length of time, it will suck blood from the souslik (Spermophilus), the guineapig, and man. On the death of its individual specific host it readily transfers itself to another such host, although it is able to remain alive, attached to hair, without food, for 10 days or more.

Plague bacilli ingested by the louse quickly multiply and fill the insect's stomach, the insect dying in 2 or 3 days ; virulent bacilli are found in the gut only, and the excrement consists almost exclusively of them. The dead louse, left in the light at room temperature and humidity, remains potentially infective for more than 13 days. Lice dead of plague can be distinguished by their dark red—or, by transmitted light, light-red—colour. Smearing the mouth-parts of the insect with virulent plague-culture did not render it infective. On one occasion a healthy Spermophilus became infected by a single transference of 40 lice from an infected tarbagan.

A. A.

LÉCAILLON (—) & AUDIGÉ (—). [**Sur les propriétés insecticides du Toluène.**]—*Ann. Epiphyties.* 1921. Vol. 8. pp. 19–25. Paris, 1922. [Summarized in *Rev. Applied Entom.* 1925. Apr. Vol. 13. Ser. B. Pt. 4. pp. 56–57.]

Bugs in a bedstead and crevices of a floor, lice on men and clothing, and fleas on dogs were destroyed by applications of toluene. The toluene appears to cause some irritation of the skin.

A. A.

HUTCHINSON (C. M.). **Micro-Anatomy of Cimex with Special Reference to the Technique of Insect Histology.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 487–498. With 3 plates.

The writer describes at great length his methods of fixation, clearing, embedding, and staining, also some detached histological observations of sections, mainly of gut of *Cimex rotundatus.*

A. A.

MILLS (Ralph G.). **Some Observations and Experiments on the Irritating Properties of the Larva of** *Parasa hilarata* **Staudinger.**—*Amer. Jl. Hyg.* 1925. May. Vol. 5, No. 3. pp. 342–363. With 11 text figs. [14 refs.]

" In August and September of 1923 there occurred in Peking a number of painful cases of dermatitis, produced by a small yellowish larva that fed in great numbers on the shrubbery . . . The slightest contact . . . was sufficient to produce an extensive lesion, which usually lasted several days." The larva is the caterpillar of a moth, and both are here figured. The lesion (figured) appears to be a superficial dermatitis spreading from a raised centre. The smart is severe, stinging or shooting, and is followed by paraesthesia, or numbness, and even by slight nervous disturbances.

The injury is caused by sharp-pointed spines scattered over the body of the caterpillar, not by the " so-called nettling hairs." These spines are hollow and contain protoplasm and a toxin.

The larva is well known to the Chinese as " Yang la tzu," or, less commonly, " Hui hua er."

A. A.

GORDON (R. M.). **A Note on Two Vesicant Beetles belonging to the Family** *Staphylinidae.*—*Ann. Trop. Med. & Parasit.* 1925. Mar. 31. Vol. 19. No. 1. pp. 47–52. With 1 plate. [7 refs.]

Notes on *Paederus amazonicus* and *P. sabaeus,* the former from Brazil, the latter from West Africa, with a reference to *P. cribripunctatus* from East Africa, and the Oriental *P. peregrinus* and *fuscipes*—all being small Staphylinid beetles emitting a vesicant fluid when irritated. The author here records a case, reported by Dr. WRIGHT, of Freetown, of severe conjunctivitis, with inflammation and swelling extending all round the eye and to the brow and cheek, caused by a small insect, believed with some probability to be *P. sabaeus,* accidentally lodging in the conjunctival fold. He also described the vesication —appearing after an interval of 18 to 24 hours—resulting from handling *P. amazonicus*; in this species minute drops of fluid could be seen exuding from the labium.

A. A.

i. WALCH (E. W.). **On the Trombiculae, Carriers of Pseudotyphus, and related Species from Sumatra. (2nd Part).**—*Kitasato Arch. Experim. Med.* 1925. June. Vol. 6. No. 3. pp. 235–257. With 26 figs. on 2 plates. [9 refs.]

ii. HIRST (S.). [**Descriptions of New Acari, mainly parasitic on Rodents.**] —*Proc. Zool. Soc. London.* 1925. Apr. Pt. 1. pp. 49–69. With 15 figs. [Summarized in *Rev. Applied Entom.* 1925. July. Vol. 13. Ser. B. Pt. 7. p. 100.]

iii. EWING (H. E.). **A Contribution to our Knowledge of the Taxonomy of Chiggers including the Descriptions of a New Genus, Six New Species and a New Variety.**—*Amer. Jl. Trop. Med.* 1925. May. Vol. 5. No. 3. pp. 251–265. With 4 text figs. [10 refs.]

iv. LARROUSSE (F.). **Contribution à l'étude des tiques de l'Annam; description de deux espèces nouvelles du genre** *Haemaphysalis* : *H. obesa* **n. sp. et** *H. lagrangei* **n. sp.**—*Ann. Parasit. Humaine et Comparée.* 1925. July. Vol. 3. No. 3. pp. 301–305. With 3 text figs.

v. FERGUSON (E. W.). **Australian Ticks.**—*Rep. of the Director-General of Public Health New South Wales, for the Year* 1923. pp. 147–157. [49 refs.]

vi. DESCAZEAUX (M. J.). **Sur la présence au Chili de l'***Ornithodoros megnini.*—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 408–409.

vii. COWDRY (E. V.). **A Group of Microorganisms transmitted hereditarily in Ticks and apparently unassociated with Disease.**—*Jl. Experim. Med.* 1925. June 1. Vol. 41. No. 6. pp. 817–830. With 3 plates. [5 refs.]

viii. Root (Francis Metcalf). **Notes on Blood-Sucking Arthropods, collected at Tela, Honduras, and Port Limon, Costa Rica, during the Summer of 1924.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1924. pp. 207–209.

i. To the Trombiculae already recorded by him from Sumatra (this *Bulletin, ante*, p. 300, and Vol. 20, pp. 473 & 800) the author now adds 2 new species that are notable as attacking man. These 2 species are described and figured, along with a table for the determination for the 5 Sumatran species previously described.

ii. 'Species from Africa. *Liponyssus bacoti* (a rat mite), and *Dermanyssus gallinae* (fowl mite) again reported as biting man.

iii. The "chiggers" described in this paper are not fleas, but larvae of velvet-mites (Trombidiidae).

iv. Six species of Ixodinae, including the two new species named in the title, are here catalogued.

v. A descriptive catalogue of the ticks of Australia. The author states that "too little is known . . . of the life-histories of Australian ticks."

vi. The Argasine ticks now known to occur in Chili are *Argas persicus* var. *porteri. Ornithodorus talaje, O. turicata*, and *O. megnini*. The last species lodges in the ear of calves (seldom of adult cattle) and sometimes of dogs; it is easily detached by a 3 per cent. solution of creolin.

vii. The micro-organisms here figured and described were found in 16 species of ticks. As the author says, many of them resemble the symbiotic fungi of the alimentary canal of certain blood-sucking insects (see this *Bulletin*, Vol. 15, p 160), but differ in being situated in the Malpighian tubules.

viii. A list of species collected with casual notes on some of them.

A. A.

Chuhar Singh (Jemadar). **A Case of Snake-Bite (*Echis carinatus*) treated with Hypertonic Saline Solution intravenously.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. p. 511.

The patient was a young Pathan adult. He was bitten (10th June) on the foot, and he tied a pugri round his leg at once. When seen about three hours afterwards the bite was incised and treated with solid $KMnO_4$, and a stimulant mixture was given. About 13 hours later he was brought to hospital semicomatose, with profuse haemorrhage from mouth, nose and incision, and his condition did not permanently improve, or the haemorrhages cease until about 25½ hours afterwards, though in the interval he received at intervals three hypodermic injections of adrenalin chloride and pituitrin and three intravenous injections of saline solution. It was not until the 5th day after the infliction of the bite that his condition was reported as good, and the wound as healing. He was discharged cured on the 10th day. Other symptoms noted were pain from the bite, slight ptosis continuing for about 12 hours, and abdominal pain. The snake was killed and identified as *Echis carinatus*.

A. A.

Sinderson (H. C.). **Snake-Bite in Iraq.**—*Edinburgh Med. Jl.* 1924. Nov. N.S. Vol. 31. No. 11. pp. 620–622.

The patient was an Indian of 28 years and of fine physique; he was bitten on the ball of the thumb by a snake accurately identified as *Echis carinatus*; little notice was taken of the bite, but for the continuous oozing of blood and the local swelling. About 6¾ hours afterwards he reached a hospital; the forearm was then much swollen and excruciatingly painful and the man was coughing up bloody sputum; about 7 hours afterwards the swelling had increased, and there was haematuria and bleeding from the gums as well as from the bite. About 24 hours after this, the man was seen by the author; he was collapsed and there still was oozing from the injured thumb; the forearm was tensely swollen and very painful, and the axillary glands were inflamed. Thereafter, until the patient's death about 63½ hours after the infliction of the bite, the wound continued to bleed, and haemorrhage also occurred from bowel, kidney, gums, and by sputum, as well as from any wounds made in the course of treatment. No antivenene being available, the author carried out appropriate treatment by local styptics and injections of horse-serum and calcium chloride, and by intravenous injections of hypertonic saline and cardiac stimulants as well as by saline injections per rectum.

A. A.

BLANFORD (H. O.). **A Case of Snake-Bite. An Unusual Incident in Sanatorium Treatment.**—*Lancet.* 1925. Mar. 14. pp. 543–544.

The patient in this case was a convalescent in King Edward VII Sanatorium at Midhurst. Taking his prescribed exercise, he was bitten by a lurking viper 2 feet long. The bite is described as a "minute scratch" between the knuckles of the index and middle fingers of the right hand. Within half-an-hour he felt faint and vomited, then had diarrhoea, and soon after that collapsed. About 4½ hours after the accident local "oedema" began, and this increased enormously and continued to spread until the 7th day, by which time it had involved arm, shoulder, jaw, back, buttocks, and left hip. Notwithstanding continuous treatment a second serious collapse occurred more than 24 hours after the accident. Pain seems to have been felt only as a result of the swelling. There was albumin in the urine; but no haemorrhages, beyond some subcutaneous ecchymosis, are recorded. The wound was scarified and rubbed with permanganate of potash within about half an hour, and the patient was kept in bed and treated with strychnine, brandy and saline infusions. The patient recovered, and it is stated that his original "pulmonary condition seemed in no way adversely affected." [It would be interesting to know whether it seems to have been improved.]

A. A.

BOUFFARD. **Un cas de mort survenue à la suite d'une piqûre par un serpent venimeux.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan. Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 126–127.

———. **Observation de morsure de serpent suivie de mort.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 353–354.

A case of bite by *Dendraspis viridis*, the victim being a strong and vigorous West African youth.

The patient when seen 4 hours after the accident was supine and completely paralysed, speechless and senseless, "as if mummified." The heart-beat was regular, 60. Nothing is said of any local reaction at the site of the bite. Twenty cc. of "antivenomous serum" (unspecified) were injected subcutaneously, but had no effect. Death occurred 7 hours after the infliction of the bite.

A. A.

DE MAGALHÃES (Octavio). **Hemiplegia organica provocada pelo veneno ophidico.**—*Sciencia Medica.* 1925. Apr. 30. Vol. 3. No. 4. pp. 302–307. With 3 figs. on 2 plates.

A clear and detailed account of a man, 24 years of age, who was bitten on the left ankle by a "cobra" [*i.e.*, a Brazilian venomous snake]. Three days later he became suddenly hemiplegic, probably due to a capsular haemorrhage. He had shown haemorrhages elsewhere during the 3-day interval; the Wassermann test proved negative both with the serum and the cerebrospinal fluid. Antivenin was given and thereafter daily injections of strychnine and arsenic, and at the time of record the condition was improving.

H. Harold Scott.

RAIMUNDA (João Manoel). **Contribuição para o estudo dos chamados** *segredos* **contra a mordedura de cobras peconhentas.** [On Secret Remedies for Cobra Bites.]—*Arquivos Indo-Portugueses de Med. e Hist. Nat.* Nova-Goa. 1925. Vol. 3. pp. 125–162.

A most interesting and useful paper on the subject of snake-bite and its treatment by various popular remedies. The article is well worth consulting in the original, for space forbids our giving details of the numerous experiments carried out with many nostrums vaunted as cures for cobra-bite. Various plants and other " secret remedies " were tested on dogs, rabbits and guineapigs. They were first given the remedy alone to see if it produced any ill effects. In a second series the " remedy " was given immediately after a dose of the poison. Eight secret remedies were examined and all proved absolutely useless. The plants submitted to test were *Glycosmis pentaphila, Tinospora cordifolia, Hemidesmus indicus, Zizyphus rugosus, Strychnos colubrina,* and *Zingiber casumunar.* All but the last of these proved also valueless. The rhizome of *Zingiber casumunar* given either subcutaneously or orally proved very efficacious; in many cases a fatal issue was prevented, in others when death appeared imminent life was prolonged for 2½ to 4 hours.

The author next wrote to various health authorities in different districts informing them of these facts and asking for their opinions and experiences of the same. The replies were uniformly favourable, the remedy being well known to all of them.

H. Harold Scott.

ANDERSON (L. A. P.) & CAIUS (J. F.). **The Effect of Storage on the Potency of Antivenomous Serum. I.**—*Indian Jl. Med. Res.* 1925. July. Vol. 13. No. 1. pp. 113–119. [9 refs.]

The following are the interesting conclusions of this paper, which records the results of experiments undertaken to determine the deterioration of Kasauli antivenom (Cobra and Russell's viper) in storage:—

" (1) This serum, like all other sera, gradually loses potency on keeping, during the first six to nine months. (2) A sudden increase in potency, to a degree higher than that originally possessed by the serum, follows the preliminary deterioration. The enhancement of potency is marked after 12–14 months' storage. (3) The enhanced potency of aged sera is not directly due to the particulate matter thrown down by ordinary centrifuging. (4) Light and heat, such as are represented by exposure in an ordinary room in the tropics, exercise no appreciable influence on the potency of antivenin."

A. A.

MARTIN (C. de C.). **The Effect of Formalin on Snake Venom. I. Diminution of Toxicity of Cobra Venom. II. Diminution of Toxicity of Daboia Venom.**—*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 807–810. [5 refs.] & Vol. 13. No. 1. pp. 109–110. [1 ref.]

I. An academic study, showing that cobra venom incubated for 24 hours, at 37° C., in solutions containing commercial formalin suffers a reduction in virulence—as has been shown by other observers to be the case with diphtheria and botulinus toxin.

II. Tested in the same manner as cobra venom—*i.e.*, by incubating the venom solution for 24 hours at 37° C. with 0·25 per cent. formalin—the virulence of "daboia" venom was diminished, but not to the same extent as cobra venom.

A. A.

CAIUS (J. F.) & STEICHEN (A.). **Notes on the Concentration of Anticobra Serum. IV. Absorption Spectrum.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 499–501. With 1 plate.

The authors' conclusions from their experiments are that "the absorption spectra of normal horse serum and antivenomous horse-serum are identical and do not point to any essential difference between the two."

A. A.

DIAS (Ezequiel), LIBANIO (Samuel) & LISBÔA (Marques). [In Portuguese & English.] **Lucta contra os Escorpiões. The Struggle against Scorpions.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 1. In Portuguese pp. 5–25. [25 refs.] In English pp. 27–44. With 1 plate.

The authors naturally limit the "struggle" to scorpions trespassing within houses, and remark that it can be evaded, or at least simplified, by constructing houses that do not attract scorpions. In experiments on a small scale they found that vapour of xylol, chloroform, naphthalin, coal gas, CS_2, SO_2, and HCN were as effective against scorpions as against insects. On a large scale for rooms and houses they had very satisfactory results with SO_2, and particularly with candles made of equal parts of sulphur and Chile saltpetre. They record a multitude of varied experiments, in one of which scorpions (and various other insects) enclosed in loosely-plugged flasks or wrapped in cloths, etc., placed in a closed cupboard in which 5 gm. of sulphur candle to the cubic metre of space was burnt were found dead when the cupboard was opened at the end of 24 hours. For fumigating rooms they recommend 10 gm. of sulphur and saltpetre candle to the cubic metre, and for fumigating an entire house 20 gm.—the place to be kept as much air-tight as possible for 24 hours. Of course, fumigation is only a temporary measure ; a fresh invasion of scorpions must be expected, especially if there are stacks of firewood or rubbish about the house to attract them. By experiment the authors found that chickens are not only considerably immune to the venom, but also are extremely fond of scorpions ; one of their chickens ate five in succession and wanted more. They therefore recommend chickens as auxiliaries. The troublesome scorpion of Central Brazil is *Tityus serrulatus.* It is incidentally mentioned that in the course of six years the Oswaldo Cruz Institute bought 107,533 scorpions for the manufacture of antivenom.

A. A.

FRETZ (H. E. King). **Transient Glycosuria following Scorpion Sting.** [Memoranda.]—*Brit. Med. Jl.* 1925. Aug. 15. p. 294.

In Trinidad, whence the author writes, scorpion sting is a frequent accident. Of two common local species of scorpions, one small and brown, the other large and black, only the latter is dangerous—to adults as well as children.

The symptoms, which follow in about half-an-hour, begin with dyspnoea and spasms and pass into a state of extreme shock, with frequent vomiting, which state lasts for about 3 hours; thereafter recovery is gradual and usually is complete in 24 hours, death being rare. Sometimes epileptiform fits occur. Albuminuria is unusual; but in 12 out of 14 cases recently observed by the author glycosuria occurred, lasting from 2 to 5 days.

A. A.

SHARP (Neville Alex. Dyce). **The Treatment of Scorpion Sting.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 15. Vol. 27. No. 24. pp. 336–337.

The treatment here recommended for scorpion sting, as giving instantaneous and almost miraculous relief, is the local injection of an ampoule of novocaine and adrenalin. Of this treatment for the excruciatingly painful wound caused by the dorsal spine of a certain fish [possibly the Siluroid, Plotosus ?] also the author speaks most infallibly from experience in his own person.

A. A.

DE MAGALHAÈS (Octavio). **Contribution à la connaissance de l'action du venin des scorpions.**—*C.R. Soc. Biol.* 1925. June 12. Vol. 93. No. 20. pp. 35–37; 42–44.

The scorpion venoms (Brazilian) studied are of 3 species of Tityus (*bahiensis, serrulatus* and *dorsomaculatus*) and an unspecified Bothriurus. These venoms are, above all, neurotoxic, and have no effect on animals that do not possess a differentiated nervous system; they act both on the cerebrospinal and on the sympathetic nervous system—in the latter case causing diarrhoea, polyuria, and exciting other glandular secretions. The Tityus venom (*bahiensis* and *serrulatus*) is also haemolytic, cytolytic, proteolytic, and lipolytic. The sap of leaves (unspecified) and of dahlia tubers is said to have a feeble, and tyrosin a decided neutralizing power over scorpion venom. The fowl, turkey, cat and some snakes enjoy some degree of immunity, which, the author considers, is probably acquired. Also, according to this author, these scorpions are not immune to their own specific venom.

A. A.

MARCENAC. **[Piqûres de scorpion au Maroc.]**—*Maroc Médical.* 1924. Dec. 15. [Summarized in *Presse Méd.* . 1925. May 9. Vol. 33. No. 37. p. 621.]

A common scorpion in Morocco is *Heterometrus maurus.* Fowls feed on it. Its venom, which has a tetanizing action like strychnine, is sometimes mortal to children, but there is not enough of it to affect adults seriously.

A. A.

CAMPOS (Oswaldo de Mello). [In Portuguese & English.] **Os escorpiões brazileiros. Scorpions of Brazil.**—*Mem. Inst. Oswaldo Cruz.* 1924. Vol. 17. No. 2. In Portuguese pp. 237–301. In English pp. 303–363. With 43 figs. on 14 plates.

A descriptive catalogue of the scorpions of Brazil—a valuable paper of purely zoological interest.

A. A.

CRUTCHFIELD (E. D.). **Dermatitis produced by the Portuguese Man-of-War.**—*Arch. Dermat. & Syph.* 1925. July. Vol. 12. No. 1. pp. 72–75. With 2 text figs.

This paper is based upon a case of dermatitis caused by contact with some species of Siphonophora which, to judge from the accompanying text-figure, is not the well-known " Portuguese Man-of-War " of the Old World.

A momentary contact caused excruciating pain, and produced wheals which even at the end of a week showed as streaks of hyperaemia and minute petechiae, or as linear blisters filled with bloody serum, and were visible after 3 months as deeply pigmented lines. Relief from pain was afforded by alkaline lotions and wet boric dressings.

A. A.

HERRE (Albert W. C. T.). **Poisonous and Worthless Fishes. An Account of the Philippine Plectognaths.**—*Philippine Jl. Sci.* 1924. Oct. Vol. 25. No. 4. pp. 415–511. With 2 coloured plates.

A taxonomic and descriptive account of the Plectognathi (Hornfishes, Triggerfishes, Filefishes, Globefishes, Porcupinefishes, and Trunkfishes) of the Philippines, the flesh of which causes the disease known locally as *ciguatera*. In this disease " the nervous system is attacked and violent gastric disturbances, paralysis, and death may follow."

A. A.

AUSTEN (E. E.). **A Contribution to Knowledge of the Blood-Sucking Diptera of the Dardanelles.**—*Bull. Entom. Res.* 1925. July. Vol. 16. Pt. 1. pp. 1–23. With 6 text figs. [4 refs.]

BARBER (M. A.), KOMP (W. H. W.) & HAYNE (T. B.). **The Significance of the Proportion of Sexes found among Anopheles in Various Resting Places.**—*Public Health Rep.* 1925. Jan. 16. Vol. 40. No. 3. pp. 105–110. [2 refs.]

BODENHEIMER (F. S.). **Ueber die Voraussage der Generationenzahl von Insekten. II. Die Temperaturentwicklungskurve bei medizinisch wichtigen Insekten.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 474–480. With 9 figs. in text. [6 refs.]

BUXTON (P. A.) & HOPKINS (G. H. E.). **The Early Stages of Samoan Mosquitos.**—*Bull. Entom. Res.* 1925. Jan. Vol. 15. Pt. 3. pp. 295–301. With 8 figs. [11 refs.]

CLEVELAND (L. R.). **Action toxique de l'oxygène sur les protozoaires *in vivo* et *in vitro*; son utilisation pour débarrasser les animaux de leurs parasites.**—*Ann. Parasit. Humaine et Comparée.* 1925. Oct. Vol. 3. No. 4. pp. 384–387.

COOLING (L. E.). **Seven Common Species of Mosquitoes described for Purposes of Identification.**—*Commonwealth of Australia Dept. of Health, Service Publication (Tropical Division).* No. 1. 24 pp. With 4 figs.

CRAGG (F. W.). **Observation on the Reproductive System of *Cimex*: Impregnation.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 451–455. [3 refs.]

EVANS (A. M.). **A New Variety of** *Anopheles marshalli* **Theobald from the Belgian Congo.**—*Ann. Trop. Med. & Parasit.* 1925. July 16. Vol. 19. No. 2. pp. 211–213. With 2 text figs.

GRASSI (B.). **Pesci nostrali antimalarici.**—*Rend. R. Accad. Naz. Lincei.* Rome. Classe Sci. fisiche, matemat. e naturali. 1923. May 20. Vol. 32. No. 10. pp. 511–513.

——. **Acclimazione delle Gambusie in Italia.**—*Ibid.* June 1. No. 11. pp. 544–548. [1 ref.]

KATSUNUMA (Seizo). **Présence de** *Trichomonas vaginalis* **dans l'urine d'un jeune garçon.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 216–217. [7 refs.]

KOFOID (Charles A.) & SWEZY (Olive). **On the Number of Chromosomes and the Type of Mitosis in** *Endamoeba dysenteriae.*—*Univ. California Public Zool.* 1925. Jan. 28. Vol. 26. No. 19. pp. 331–352. With 27 figs. on 3 plates & 1 text fig. [20 refs.]

LEPINE (Pierre). **Culture de** *Trypanosoma lewisi* **en différents milieux au sérum et au sang.**—*C.R. Soc. Biol.* 1925. July 24. Vol. 93. No. 26. pp. 523–524.

MACGREGOR (Malcolm E.). **Mosquitos under Winter Conditions.**—*Bull. Entom. Res.* 1925. Apr. Vol. 15. Pt. 4. pp. 357–358. [1 ref.]

MACPHERSON (John). **Venomous Sea-Snakes.** [Correspondence.]—*Med. Jl. Australia.* 1924. Dec. 13. 11th Year. Vol. 2. No. 24. pp. 642–643.

MISSIROLI (Alberto). **I tubuli del Malpighi nell'** *Anopheles claviger* **ibernante. 1a Nota.**—*Ann. d'Igiene.* 1925. Feb. Vol. 35. No. 2. pp. 113–122. With 2 figs. on 1 folding plate. [3 refs.]

PALLARY (Paul). **Comment recueillir les mollusques.**—*Arch. Inst. Pasteur d'Algérie.* 1924. Dec. Vol. 2. No. 4. pp. 564–566.

PINTO (Cesar). **Biologia do** *Triatoma brasiliensis* **Neiva.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 541–543. With 3 figs.

PURI (I. M.). **Studies on the Anatomy of** *Cimex lectularius* **I.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 84–97. With 12 figs. & 1 plate. [30 refs.]

ROUBAUD (E.). **Nouveaux diptères piqueurs de l'est africain.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 465–469. With 2 text figs. [4 refs.]

SHORTT (H. E.). **Note on a Method of obtaining Stereoscopic Photographs of Entomological Subjects.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 339–340. With 1 plate.

SINTON (J. A.). **Notes on Some Indian Species of the Genus** *Phlebotomus.* **Part XIII. Methods of Collection and Preservation.**—*Ibid.* 1925. Apr. No. 4. pp. 801–806. [2 refs.]

——. **Notes on Some Indian Species of the Genus** *Phlebotomus.* **Part XIV. The Hypopygium of the Female** *Phlebotomus.*—*Ibid.* July. Vol. 13. No. 1. pp. 97–108. With 23 figs. on 2 plates. [12 refs.]

VAN DEN BRANDEN (F.). **Contribution à l'étude de la répartition de l'***Ornithodorus moubata* **dans le Moyen-Congo.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. p. 303.

YAKIMOFF (W. L.) & MILLER (G. A.). **Les protozoaires de l'intestin des rats d'égout.**—*Bull. Soc. Path. Exot.* 1925. Apr. 8. Vol. 18. No. 4. pp. 311–312.

—— & WASSILEWSKY (W. J.). *Oicomonas granulata* **dans l'intestin des souris blanches.**—*Ibid.* pp. 310–311. [2 refs.]

REVIEWS AND NOTICES.

ROLLESTON (Humphry). [Bart., K.C.B., Regius Professor of Physic in the University of Cambridge; President of the Royal College of Physicians of London.] **On Writing Theses for M.B. and M.D. Degrees.** Second Edition Revised. 28 pp. 1925. London: John Bale, Sons and Danielsson, Ltd., 83–91, Great Titchfield Street, W. 1. [Price 1s. net.]

Since writing does not come to everybody as it did to neighbour Seacole, by nature, and since the medical curriculum provides no teaching in the business of professional authorship, the university candidate may give God thanks for this booklet on the art of writing theses for M.B. and M.D. degrees, now in its 2nd edition.

The author explains that a thesis must be a sustained argument based either on original observation or on original thought—not a mere compilation. It must have a well-defined scope, expressed in a strictly relevant title and concisely explained in an introductory statement. It should be introduced, further, by a succinct history of the subject proposed, and a statement of the appropriate material investigated and of the methods pursued in the investigation. All the essential facts and results of observation can then be set forth in their proper order and in their relation to the recorded observations of other authors, and after the facts the equitable conclusions from them. Tabulated detail can follow apart, and a list of *verified* references to the authors quoted. All this scaffolding of a thesis is a mechanical business, easily acquired; but the author also gives valuable advice in the more difficult matters of choosing a subject for a thesis and working-up the subject chosen, and much good counsel about literary style and its refinement by frequent sacrificial revision of the first fair draft. As models of style for the thesis-writer one would have liked to see the names of FIELDING and HUXLEY—two of our own clearest stars—in the author's galaxy.

A. Alcock.

BEATTIE (J. Martin) [M.A. (N.Z.), M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.), Professor of Bacteriology, University of Liverpool, etc.] & DICKSON (W. E. Carnegie) [M.D., B.Sc., F.R.C.P. (Edin.), Pathologist to the West End Hospital for Nervous Diseases, London, etc.]. **A Textbook of Pathology General and Special for the Use of Students and Practitioners.** Third Edition.—1103 pp. With 17 coloured plates & 499 text figs. 1925. London: William Heinemann (Medical Books), Limited. [Price, 42s. net.]

So large a treatise as this is (and the single volume edition is uncomfortably weighty) necessarily gives a fairly complete survey of pathology—general pathology and pathological anatomy and histology—though bacteriology and diseases of the female generative organs have been deliberately omitted on the ground that these subjects are dealt with in text-books of bacteriology and works on gynecology. The 499 text figures and the large and open type appreciably reduce, however, the actual amount of matter presented to the reader in the 1,100 pages of this third edition to within manageable limits!

A word of praise must be bestowed upon the illustrations: the text figures, whether of macroscopic specimens or of microscopic structures, almost always show what they are intended to, and some of the coloured plates, of which there are 17, are very beautiful, notably those on inflammation and repair. The arrangement of the matter follows stereotyped lines, the first half or so of the volume (Part I) being devoted to general pathological processes, the second half (Part II) to a description of the diseases of the various systems and organs. Of the former, the chapters on inflammation and repair and on fever are notably good. Animal parasites, protozoan and metazoan, are somewhat fully dealt with, and the matter of this chapter is on the whole accurate and sufficient, but no reference is made to the wanderings of the larval *Ascaris* in the tissues, nor to the cyclopean stage of *Dibothriocephalus*. *Balantidium coli* is just mentioned as being "described as occurring in man and believed by some writers to give rise to diarrhoea."

In considering the subject of neoplasms, ADAMI's classification is adopted and a good summary is given of the various hypotheses of their genesis, though there is no mention of the Rous chicken sarcoma which (quite apart from recent work) is of considerable interest and importance in this connexion.

Certain conditions which merit some notice seem to have been forgotten, and we can find no account *inter alia* of rabies, Parkinson's disease, lenticular degeneration and myasthenia gravis. In connexion with encephalitis lethargica no reference is made to the herpetic viruses, in disseminated sclerosis there is no mention of the alleged finding of spirochaetes, and the changes in general paralysis of the insane are dismissed in less than a page.

The importance of iodine-deficiency in the genesis of goitre receives no mention, and we have found but two brief references to vitamins. In consequence, the discussions of the etiology of scurvy and of rickets are wanting and old fashioned. A lack of adequate revision is evident here and in other places, *e.g.*, in the reference to beriberi neuritis and the statement that Rose BRADFORD and his fellow workers have *recently* described a filter-passing organism in multiple neuritis (both on p. 1,015). A bare reference is given to haemoglobinuria in blackwater fever and in paroxysmal haemoglobinuria, no mention is made of the importance of the concentration of blood urea in gauging the significance and gravity of albuminuria and nephritis and all reference to renal efficiency tests seems to be omitted.

After all, it is easy to pick holes in a tome of 1,100 pages, and actually the blemishes we have noted are few and far between. The production of the work must have entailed enormous labour, and the authors are to be congratulated on the general excellence of the book.

R. Tanner Hewlett.

GAVIÃO GONZAGA (A.). [Inspector Sanitario do D.N. de Saude Publica. Chefe de Serviço na Directoria de Saneamento Rural.] **Climatologia e Nosologia do Ceará. Pagines de Medicina Tropical.**—172 pp. With 67 text figs. & 2 maps. 1925. Rio de Janeiro: Baptista de Souza—Rua da Misericordia, 51.

The first part of this book deals with the general topography and climatic conditions of Ceará. The country may be divided into three zones—the littoral, the elevated plains and the hilly districts of the interior. The climate on the whole is warm and dry; the mean annual temperature of the littoral is 26·1°, of the elevated plains 27·5°, and of the hills 20·7°. Rainfall is variable and irregular. Generally speaking, the plains register about half the rainfall of the littoral district. Vegetation suffers accordingly and climatic conditions are described as averse to white colonization.

The second part, dealing with the prevailing diseases of the country, is very interestingly written, though one would wish for more detail. Early records of yaws are not reliable since, as elsewhere, this condition was long confused with syphilis, but that they were regarded as not quite the same is evidenced by a quotation from a book written in 1864 describing a disease "very similar to the Neapolitan disease" which prevailed at Maranhão. Whether it is indigenous or of African origin is uncertain. It now constitutes a veritable scourge, as many as 60 per cent. of the inhabitants of some parts of the highlands being attacked. The transmitter is believed to be a fly of the genus *Hippelates* which is very abundant and swarms on framboesial ulcers.

Venereal diseases—syphilis, soft sore, gonorrhoea and granuloma—are all prevalent and treatment most inadequate. The wide distribution of trachoma is ascribed to the low humidity, brilliant sunshine, sandy soil and excessive heat. Several insects probably take part in its dissemination, notably *Ophthalmomyia lacteipennis*, *Piophila casei*, and species of *Musca*, aided by the unhygienic manner of living. Inspection of children is being attempted and there is great hope of reducing the number of cases. The author states that helminthic affections in general and ankylostomiasis in particular do not constitute a serious problem as climatic conditions do not favour the evolution of the latter. Nevertheless, the average index of infection is 68 per cent. in the littoral district, 54 in the hills, and 32 in the plains.

Malaria is rather of intermittent prevalence, namely, in the rainy seasons and in certain districts, particularly the banks of the Jaguaribe, the Acarahú and its tributaries. *Plasmodium vivax* and *P. falciparum* largely predominate, the quartan parasite being rare. The only species of Anopheles seen are *A. argyrotarsis* and *A. albimanus*. Plague made its appearance in Ceará in 1900. No statistics are given, but the type would seem to be mild. Photographs of three cases, all children, are reproduced ; none appears to be seriously ill, and one is photographed standing up.

Tuberculosis, yellow fever, Chagas's disease, leishmaniasis (cutaneous and mucocutaneous) receive brief mention. The first case of yellow fever occurred in Fortaleza in 1851 and some twenty places are enumerated as endemic foci, but no figures are given except that in the period October, 1922, to June, 1923, there were 47 cases, of whom 23 died. In the following year a Commission of the Rockefeller Foundation took matters in hand. It is worth noting that during an interval of 30 years, from 1877 to 1907, no cases were recorded. Smallpox is said to be extinct. Leprosy is somewhat prevalent. 59 districts are mentioned from which there were 442 recorded cases in January, 1925. Fortaleza heads the list with 164, Jaguaribe-Mirim coming next with 36. In the author's opinion the total is probably about 800.

The book is well supplied with photographs taken by the author, but the majority have been indistinctly reproduced. The whole study bears evidence of careful observation, and is useful as indicating the variety of diseases which may be met with. The usefulness would be much enhanced if statistics of their prevalence were given and not merely a brief account of their history and existence.

H. Harold Scott.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

. 22.] 1925. [No. 12.

BERIBERI.

KEPLER (E. J.). **Beriberi from a Diet of Raw Starch.**—*Jl. Amer. Med. Assoc.* 1925. Aug. 8. Vol. 85. No. 6. pp. 409–412. With 4 text figs. [7 refs.]

The patient was a coloured woman aged 28, admitted to the Neurological Clinic of the Philadelphia General Hospital. The most irregular feature of the case, which was finally diagnosed as beriberi, was that the oedema was associated with nephritis, but this might have been due to intravenous injections of a new preparation of calcium and free iodine. The probable cause was excessive consumption of raw starch, up to 1–2 lbs. a day, the use of which had become quite an obsession. No symptoms of note occurred for about ten months, but as the patient had at least one ordinary meal each day this would delay the onset of the beriberi. Recovery followed the resumption of a normal diet.

P. W. Bassett-Smith.

BERNARD (P. Noël). **Réaction de déviation du complément dans le béribéri humain.**—*C.R. Soc. Biol.* 1925. Apr. 10. Vol. 92. No. 13. pp. 1038–1040. [5 refs.]

In continuation of his previous work demonstrating that the *B. asthenogenes* had a definite relationship to human beriberi, Bernard has carried out experiments to determine whether there are present in human beriberi any antibodies to the organism and its toxin. He admits that the difficulties of proof are great, since in severe cases there may not be time for their production and in chronic cases these bodies may have passed away. The method used was that of complement fixation according to the technique of CALMETTE and MASSOL. The antigen is made from a filtered culture of *B. asthenogenes* grown anaerobically, when the toxin produced is at its maximum; the filtrate is centrifuged, washed in saline, and diluted. This emulsion is then heated for 5 minutes to boiling point and preserved in the ice chest; the immune serum is heated to 55° C. Guineapig serum is used for complement, and the haemolytic system consists of rabbit serum and sheep cells. 131 sera of natives were tested, of which 76

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were from cases of beriberi in hospital; 65·7 per cent. of these gave a positive reaction, and 34 per cent. were negative; 5 of the latter were cases of malarial neuritis and 1 of syphilis. 56 cases other than beriberi, when tested, gave 53 negative reactions. It is therefore contended that this reaction has a considerable value and helps to establish the relationship of *B. asthenogenes* to beriberi.

P. W. B-S.

KOZAWA (S.), KUSUNOKI (M.) & HOSODA (N.). **On the Contents of Nonprotein Nitrogen in Blood of Human Beriberi and Avitaminosis of Rabbits.**—*Japan Med. World.* 1925. Apr. 15. Vol. 5. No. 4. pp. 83–86. [11 refs.]

Work of previous authors, mostly Japanese, is referred to and details of the present experiments on both human beriberi cases and the experimental disease in rabbits are given. They show that there is an increase of the nonprotein nitrogen in the blood serum of rabbits with avitaminosis, and that in the patients with beriberi it was 2–3 times more than the normal. Further experiments are being carried out.

P. W. B-S.

MONTEL (M. L. R.), TRAN VAN AN & DANG VAN CÚÓNG. **Tension artérielle et viscosité sanguine dans le béribéri chez les Annamites de Cochin-chine.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 475–477.

After an investigation of the blood conditions in the local malaria of Saigon the authors turned their attention to beriberi, 48 chronic cases of which were under observation. The arterial tension was found to be higher than in the normal Annamese or in those suffering from malaria. This is therefore stated to be a useful factor in the differential diagnosis of forms of neuritis. In beriberi the viscosity of the blood was of no diagnostic value, but it was generally higher than normal. It is noted that cardio-vascular irregularities are easily induced among these natives.

P. W. B-S.

CHAHOVITCH (X.). **Béribéri expérimental et insuline.**—*C.R. Soc. Biol.* 1925. Aug. 14. Vol. 93. No. 27. pp. 652–655. [4 refs.]

The author investigated the action of insulin upon healthy birds and those suffering from artificially-induced beriberi (B. avitaminosis). He found that in healthy pigeons insulin neither produces nervous phenomena nor lowers the temperature, but in those with avitaminosis it aggravates the symptoms, produces other nervous signs, and notably reduces the temperature; which phenomena disappear as the effect of the insulin wears off. MATTON and others have noted a fall of temperature in rabbits after injections of insulin, and NIYONS records similar effects in healthy pigeons; his results differ therefore from those of the author.

P. W. B-S.

BACHARACH (Alfred Louis). **A Note on the Basal Vitamin B-Free Diet of Drummond and Watson.**—*Biochem. Jl.* 1925. Vol. 19. No. 4. pp. 638–640. With 1 text fig. [5 refs.]

The author states that the lemon juice of the modified Drummond basal diet should be omitted for experimental purposes, as it contains besides vitamin C a certain amount of vitamin B. He also states that its omission is not detrimental to the rats used.

[The interesting series of curves appears to demonstrate this, and shows the remarkable value of marmite, the source of vitamin B, in the growth of the animals.]

P. W. B-S.

EGGLETON (Philip) & GROSS (Louis). **A Note on the Blood-Sugar Levels of Rats fed with Complete Diets and Diets Deficient in Vitamin B.**—*Biochem. Jl.* 1925. Vol. 19. No. 4. pp. 633–637. With 3 text figs. [10 refs.]

The normal and basal blood-sugar levels of rats fed on complete and vitamin B-deficient diets were ascertained. The rate of absorption of glucose from the alimentary tract was unaffected by vitamin B deficiency; glycogen gradually disappeared from the liver when vitamin B was eliminated from the diet. A causal relationship between vitamin B content and the food intake is suggested; the vitamin would appear to have a direct stimulating influence on the rat's appetite.

P. W. B-S.

i. ITO (Hisae). **[On the Vitamin B Contents of the Viscera of the Normal and Polished Rice Diseased Pigeons.]**—*Osaka Igakkai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. Oct. Vol. 23. No. 10. [Summarized in *Japan Med. World.* 1925. Mar. 15. Vol. 5. No. 3. p. 73.]

ii. ——. **[Exclusive Experimental Feeding of the Pigeon and Rabbit with Corn.]**—*Osaka Igakkai Zasshi* (*Jl. of Osaka Med. Soc.*). 1924. Oct. Vol. 23. No. 10. [Summarized in *J.M.W.* p. 73.]

iii. TAKAYAMA (Shiro). **[On the Relation between Hyperglycemia and Blood Saccharolytic Ferment in Avian Polished Rice Disease.]**—*Chugai Iji Shimpo.* (*Central Med. Jl.*). 1925. Mar. Vol. 44. No. 6. [Summarized in *J.M.W.* May 15. No. 5. p. 128.]

iv. ——. **[On B-Avitaminosis of Man and Animals and on the Blood Catalase of the Beriberic Cases. I & II.]**—*Nissin Igaku* (*Progress in Med.*). 1925. Nov. & Dec. Vol. 14. Nos. 3 & 4. [Summarized in *J.M.W.* June 15. No. 6. p. 158.]

i. The author estimated the Vitamin B content of the organs of pigeons by the curative efficiency of the dead viscera when given to birds suffering from experimental polished rice disease. The relative values of liver, stomach, intestine and muscles were 1·5, 1·0 and 3·0. The heart having the highest content, and there being none in the lungs.

ii. It was found that 3 gm. (per diem) of corn was able to cure completely polished rice disease of pigeons. It was not good food for rabbits, as when used exclusively 55 per cent. of these developed a beriberi-like disease, while the other 45 per cent. died of inanition.

iii. The author concluded from his experiments that as the hyperglycemia in avian polished rice disease became more and more manifest the saccharolytic ferment would become less, differing from that which occurs in simple starvation.

iv. The author used pigeons, fowls, rats, dogs and man in these experiments and concluded that beriberi and B. avitaminosis are identical with each other so far as the blood catalase is concerned.

P. W. B-S.

SCURVY.

GILKS (J. L.). **An Outbreak of "Rand Scurvy."**—*Kenya Med. Jl.* 1925. July. Vol. 2. No. 4. pp. 104–110.

The author reports an interesting and rather peculiar outbreak of a form of scurvy among the Masai prisoners in the Nairobi jail in 1924. Nine cases were affected out of 13. Practically all were anaemic on arrival and being under heavy sentences were kept in special cells separate from the ordinary prisoners. They received the ordinary diet, which was liberal, but probably deficient in vitamin C. The symptoms conformed with those of Rand scurvy—oedema, painful joints, spongy gums, increased knee jerks, etc. The lower limbs were affected in all cases, causing difficulty in walking, which did not affect others in the jail. The debilitated condition of these prisoners, with isolation, want of exercise, little sunlight and a dietary very different from that to which they were accustomed, were the chief contributory causes of the outbreak. There was one death from progressive anaemia and heart failure. A similar outbreak was reported in 1906.

P. W. Bassett-Smith.

FRANK (A.). **Ueber den Gehalt der Milch an skorbut-verhütenden Stoffen.** [On the Anti-Scurvy Bodies in Cow's Milk.]—*Klin. Woch.* 1925. June 18. Vol. 4. No. 25. pp. 1204–1208. With 5 charts in text. [41 refs.]

The amount of vitamin C in milk depends, as has been previously shown, on the source and the method of preservation. The author emphasizes the fact that a short heating at a high temperature is less deleterious than a long one at a low temperature, and that, even if preserved milk retains any vitamin, this is useless for sucklings, as the milk is given in such great dilution. Milk under any conditions is poor in the antiscorbutic factor. MEYER & NASSAU state that goat's milk has little antiscorbutic value, and that 3 per cent. soda preserves the vitamin ; this is against the usual teaching that alkali reduces its activity. HESS has shown that 340 gm. of human milk reduced the symptoms in a child, whereas 450 gm. of cow's milk was insufficient. In experiments on guineapigs of about 250 gm. weight the author gave up to 60 cc. of human milk ; these animals died after 24 and 28 days (as if they had not had any vitamin C at all). Goat's milk gave similar results.

The various milks used at the Clinic gave the following results :—Institute milk for infants, very good ; one guineapig died on the 45th day, the other was alive after three months. Market milk, similar. Clinic milk, the same. The milk in Leipsic was used fresh and without preservatives. These results differ from those of MEYER & NASSAU in Berlin. In Leipsic, though vitamin C is low in fresh milk, it is enough to protect infants from scurvy. He does not agree that constant biological tests are necessary for the control of the milk supply, but advises better laws for cow-keeping. H_2O_2 should not be used as a preservative, slow Pasteurization should be avoided, and green winter fodder should be given to the milch cows.

P. W. B-S.

CAVANAUGH (G. W.), DUTCHER (R. A.) & HALL (J. S.). [**Antiscorbutic Potency of Whole-Milk Powder.**]—*Indust. & Engineering Chem.* 1924. Vol. 16. pp. 1070–1073. [Summarized in *Med. Sci. Abstr. & Rev.* 1925. Feb. Vol. 11. No. 5. p. 335.]

It has generally been stated that milk dried by the Merrell-Soule spray process loses practically all its antiscorbutic potency; that this is not so is shown by the authors' experiments. No observations of the antiscorbutic value of a given milk before and after heating have been recorded previously.

In the present experiments, mixed milk from a herd of cows was used; samples of the mixed milk in the fresh state were fed to one batch of guineapigs, and equivalent samples dried by the above-mentioned process were fed to another batch, the basal diet for both batches containing no other antiscorbutic. It was found that the weight curves of both batches were almost exactly similar and where the amount of dried milk was insufficient to prevent scurvy, the disease developed at the same time and to the same extent in those fed upon a corresponding amount of the fresh milk.

P. W. B-S.

LIOTTA (Domenico). **Studio sullo scorbuto e sul valore antiscorbutico del succo di arance e di limoni.** [Scurvy and the Preventive Use of Orange and Lemon Juice.]—*Arch. d. Farmacol. Sperim. e Sci. affini.* 1925. May 1. Year 24. Vol. 39. No. 9. pp. 202 224. [62 refs.]

The antiscorbutic power of oranges and lemons being reduced by keeping, the author tried the effect of passing chlorine through the juice till the latter contained 0·5 per cent. of the gas. He found that the product kept well, did not ferment, and was not attacked by moulds. Its antiscorbutic value was not very high; to guineapigs of 400-500 gm. weight 5–6 cc. was given daily, and death occurred from scurvy in about double the length of time during which control animals survived on a scorbutic diet without the juice.

H. Harold Scott.

VAGLIANO (M. S.). **Persistance du pouvoir antiscorbutique du sirop d'orange.** -*C.R. Soc. Biol.* 1925. Aug. 14. Vol. 93. No. 27. pp. 602–604. With 1 text fig. [4 refs.]

The experiments were made to determine whether the conservation of orange juice in syrup would modify its antiscorbutic properties under various conditions of keeping. Orange juice 4 parts, sugar 2 parts, and water 1 part were mixed and boiled in the open at 115° C. for 1–2 hours until the whole became a syrupy mass, and after six months this was tested on guineapigs. The results showed that the syrup had preserved its antiscorbutic value almost intact. The sugar preserves the vitamin C, the author states, just as it does in sweetened concentrated milk.

P. W. B-S.

ZILVA (Sylvester Solomon). **The Antiscorbutic Fraction of Lemon Juice. III.**—*Biochem. Jl.* 1925. Vol. 19. No. 4. pp. 589–594. [8 refs.]

This report details an endeavour to improve the method of extracting the antiscorbutic factor from lemon juice. It was found that neutral lead acetate does not precipitate the active principle in either lemon juice or swede juice, whereas basic lead acetate will do so; also that there is no connexion between the amide nitrogen and the antiscorbutic activity of lemon juice, but experiments on the amino fraction are very uncertain owing to the difficulties of isolating these bodies. The results described by BEZSSONOFF are adversely criticized.

P. W. B-S.

HAUGE (Sigfred M.) & CARRICK (Carey W.). **The Antiscorbutic Properties of Eggs.**—*Jl. Biol. Chem.* 1925. May. Vol. 64. No. 1. pp. 111–112. [14 refs.]

The authors found that the eggs of hens fed upon an antiscorbutic diet gave no protection against the development of scurvy. In daily quantities up to 20 cc. of white, or 15 cc. of yolk, it was ineffective for guineapigs. These findings are contrary to those of McCOLLUM, who states "that egg yolk is at least comparatively rich in water soluble C."

P. W. B-S.

PALLADIN (Alexander) with KUDRJAWZEWA (A.) & NORMARK (P.). **Beitrage zur Biochemie der Avitaminosen. Nr. 1. Kohlehydratstoffwechsel bei experimentellem Skorbut.** [PALLADIN.] [Carbohydrate Metabolism in Experimental Scurvy.]—*Biochem. Ztschr.* 1924. Oct. 30. Vol. 152. No. 3, 4. pp. 228–245. [11 refs.]

Nr. 2. Stickstoffwechsel (insbesondere Kreatinstoffwechsel) bei experimentellem Skorbut. [Nitrogen (particularly Kreatin) Metabolism in Experimental Scurvy.] [PALLADIN & KUDRJAWZEWA.] —*Ibid.* Nov. 8. No. 5/6. pp. 373–387. With 2 figs. [9 refs.]

Nr. 3. Blutfermente bei experimentellem Skorbut. [NORMARK.]—*Ibid.* pp. 420–425. [8 refs.]

1. For these experiments guineapigs of 350 gm. weight were employed, and a basal diet of boiled oats and water. The points chiefly studied were the blood sugar, amylase and glycogen content.

On changing to a non-vitamin diet hyperglycaemia commenced, reached its maximum about the end of the second week of the scurvy, and then decreased steadily until the animal died in a condition of hypoglycaemia. The occurrence of the characteristic scurvy symptoms coincides with hypoglycaemia. The amylase content of the blood ran parallel to the blood sugar. The glycogen decreases in the liver and at the end of the scurvy can no longer be distinguished.

2. In experimental scurvy caused by a deficiency of vitamin C the nitrogen content in guineapigs alters. There is an increase in kreatin production in the muscles. The kreatin appears in the urine and increases continuously during the disease. This increase of the kreatin in the muscles runs a parallel course to that of the disease.

3. This study of the ferments in experimentally-produced scurvy deals chiefly with amylase, the ferment on which scurvy has the greatest influence, since the carbohydrate changes are primarily influenced by the lack of vitamin C. The results obtained were in general agreement with previous findings. In guineapigs the amount of blood available for examination is small, so that deductions are not very satisfactory; using the method of BACH the amounts of katalase, protease, peroxydase and lipase were determined.

P. W. B-S.

LEPPER (Elizabeth Herdman) & ZILVA (Sylvester Solomon). **The Bicarbonate of the Plasma and the Hydrogen Ion Concentration of the Blood of Guinea-Pigs suffering from Scurvy.**—*Biochem. Jl.* 1925.. Vol. 19. No. 4. pp. 581–588. [14 refs.]

The experiments were carried out to determine whether in scurvy in guineapigs there is diminution of the bicarbonate in the blood or any alteration in the reaction. The blood was obtained by cardiac puncture and collected under paraffin in tubes with a little potassium oxalate. The experiments are described in detail and the conclusions were that in health the amount of the bicarbonate in the plasma showed great variations, but the hydrogen ion concentration was fairly stable. In scurvy guineapigs the alkalinity was on the average at a lower level than in the normal, owing to the deficiency of sodium and potassium salts of organic acids in the scurvy-producing diet. Addition of citrate of soda to the ration, though it restores the normal alkalinity, does not influence the onset of scurvy.

P. W. B-S.

WOLBACH (S. Burt) & HOWE (Percy R.). **The Effect of the Scorbutic State upon the Production and Maintenance of Intercellular Substances.**—*Proc. Soc. Experim. Biol. & Med.* 1925. Apr. Vol. 22. pp. 400–402.

Guineapigs under strict vitamin C deficiency diet were studied to note the effects of the antiscorbutic employed. The earliest evidence of scurvy was found in the incisor teeth, a separation of the dentine from the layer of odontoblasts occurring on the 6th–7th days, and the space being filled with fluid. Bone formation rapidly ceases, but osteoblasts continue to proliferate especially under the periosteum. Repair of both soft and bony tissues is impaired in scurvy ; the proliferation of the fibroblasts is little affected, but there is a marked diminution of the amount of inter-cellular substance. The authors conclude that the scorbutic state may be characterized as one affecting the supporting tissues in which the cells are unable to produce and maintain intercellular substances, and the hypothesis is brought forward " that in the formation of intercellular substances there is a change of the material from a liquid to a solid or jell state, and that the missing factor in the scorbutic condition is one affecting the jelling or setting of a liquid product."

P. W. B-S.

MOURIQUAND, LEULIER, MICHEL, IDRAC. **Avitaminose C et cholestérinémie.**—*C.R. Acad. Sci.* 1925. June 2. Vol. 180. No. 22. pp. 1699–1701. [2 refs.]

The experiments were carried out to determine the changes caused in the blood of guineapigs by deficiency of vitamin C in the food. It was found that such deficiency, whether acute or chronic, did not appear to alter the cholesterin content.

P. W. B-S.

UNDULANT AND ABORTUS FEVERS.

SEE (Pierre). **La fièvre de Malte. Sa fréquence relative. Traitement et prophylaxie.**—*Médecine.* Paris. 1924. Dec. Vol. 6. No. 3. pp. 213–218.

This is a preceptorial article and contains nothing new. The author is not quite unimpeachable in stating that it is logical to conclude "with the English tropical school that the efficacy of antimelitensis vaccine is insufficiently established," and that as the vaccine prepared by NICOLLE and CONSEIL for prophylatic use, both for animals and men, has given such encouraging results we should persist with it.

P. W. Bassett-Smith.

HOLT (Rufus L.) & REYNOLDS (Francois H. K.). **Malta Fever and its Prevalence along the Mexican Border.**—*Milit. Surgeon.* 1925. Apr. Vol. 56. No. 4. pp. 414–424. [8 refs.]

The condition known as Texas slow fever, Malta fever, or goat fever has long existed in Mexico. Since 1911 several epidemics which have spread along the Mexican border have been investigated. In dry years in herds of goats affected with what the ranchers call goat fever the percentage loss from abortion is very high, up to 50 per cent. It is, therefore, a serious economic consideration, as hundreds of ranchers in Texas, New Mexico and Arizona depend entirely, or to a great extent, on goats as a source of income. It is stated that herdmen always boil the milk before use, but as the infecting organism can live long in soil it is easily spread by inhalation and ingestion. The manure is also heavily infected and a source of contamination. On examination a large percentage of the animals were carriers, the specific organism being isolated from the blood and milk. Cases in man are often overlooked. Of the 22 counties on the border 15 are known to be affected; the disease is more common in South-west Texas than in South Central, and rises in frequency in New Mexico and Arizona. It is important that a national effort should be made to control the disease.

P. W. B-S.

ZDRODOWSKI (P.). [**On Spontaneous Malta Fever in Goats.**]—*Trav. Inst. Microbiol. et Hyg. d'Azerbaidjan* (Baku). 1924. No. 1. pp. 103–113. [In Russian.]

In 1922 the author established the presence of undulant fever in four persons in a village of Azerbaidjan (Caucasus). The infection was traced to a group of six goats, two of which were found to be suffering from undulant fever. One was kept under observation at the Institute for two years, and the course of infection and results of post-mortem examination are here recorded. The diagnosis was based on the agglutination reaction, no micrococci having been recovered. During the first year of observation the goat manifested all symptoms of the disease (bronchitis, affection of the joints, presence of agglutination); during the second year it appeared to be quite healthy, only the joint in one limb being ankylosed. The agglutinating titre decreased during the first year, and was absent during the second; the clinical symptoms showed a gradual amelioration, the animal having recovered spontaneously in the course of two years.

The author draws attention to certain peculiarities in the morbid anatomy of this case, viz., the presence of necrotic foci in the lung, liver, and kidneys, vacuolar degeneration of the liver-cells, chronic glomerulo-nephritis, and suggests that the Azerbaidjan strain of micrococcus may be a local variety (varietas caucasica). [The statement that the animal had recovered is open to doubt.—P. W. B-S.]

C. A. Hoare.

VANNI (Vittorio). **I dati clinici e sperimentali della forma pseudo-tubercolare della febbre di Malta.**—*Riforma Med.* 1925. June 15. Vol. 41. No. 24. pp. 555–557. With 2 text figs. [3 refs.]

Cases of undulant fever resembling in many respects tuberculosis may be distinguished clinically by the character of the pulse, the enlargement of the liver and spleen, the favourable termination and the beneficial effects of specific treatment. Experimentally, the author observed in guineapigs a pulmonary localization of the *M. melitensis* after inoculation and the production of a peribronchitis with "interstitial inflammation" and a broncho-pneumonia, or a congestive form with a condition resembling grey hepatization in circumscribed or more extensive areas. [A diagnosis on the clinical characters alone would be found very unreliable.—P. W. B-S.]

H. Harold Scott.

BALFOUR (Andrew). **The Treatment of Undulant Fever: A Suggestion.** [Correspondence.]—*Brit. Med. Jl.* 1925. July 11. p. 86.

The writer states that as reported, mostly from American sources, Mercurochrome 220 and medicinal Gentian Violet are very valuable remedies in septicaemia. He has already advocated the use of the former in plague, for which it appears to have some value, and now suggests that it would be useful in undulant fever, given intravenously; or, if it failed, the second drug might be used. It might be of value also as a prophylactic and curative agent for goats.

[It is generally believed that any germicide given intravenously is so rapidly diluted that it ceases to be effective. Eusol has proved useless, but good results (unconfirmed) in goats have been reported by SCORDO with perchloride of mercury.]

P. W. B-S.

STRACHAN (P. D.). **Treatment of Malta Fever.** [Correspondence.]—*S. African Med. Rec.* 1925. July 25. Vol. 23. No. 14. p. 324.

In reference to a letter supporting vaccine treatment for undulant fever the author states that he knows of no rational explanation how this can benefit a septicaemic disease, nor does he see any advantage in the practice. His unfavourable conclusions in 1911 were based upon 15 cases, and in two of these there was local abscess formation, [a result that never occurred in hundreds of cases treated at Haslar]. The remark that novarsenobillon acts by raising the patient's resistance rather than bactericidally is probably true. The statement that since the fever was stamped out in the Navy and Army there has been little literature on the subject is not flattering to our French confrères.

[It has been the reviewer's constant opinion that the vaccine should not be given in the acute septicaemic period but in the more chronic stage with localized infection.]

P. W. B-S.

B[URNET] (E.). **Note bibliographique. A propos** de la **présence du** *M. melitensis* **dans le lait d'une femme** infectée. –*Arch Inst. Pasteur de Tunis.* 1925. Apr. Vol. 14. No. 2. p. 246.

Referring to a case already reported, the author notes that *M. melitensis* has been observed in human milk by EYRE, MCNAUGHT, KENNEDY and ZAMMIT. Resistance of the new-born to infection by the milk of the infected mother has been observed in goats by ZAMMIT. Of four kids of an infected mother, three were immune; the fourth did not present any clinical signs, but after death the organism was found in the kidney (possibly accidentally in the course of elimination). It is certain that animals born and suckled of a healthy mother have a certain amount of immunity and, as suggested by ZAMMIT, they would slowly cause the flock to become immune.

P. W. B-S.

BURNET (Et.). **Aperçu des acquisitions récentes sur la fièvre méditerranéenne.**—*Bull. Inst. Pasteur.* 1925. May 15 & 31. Vol. 23. Nos. 9 & 10. pp. 369–382; 417–432. [79 refs.]

The author gives a very interesting review of recent history and laboratory work relating to the extension of the disease inland and over the world, animal experimental research, the intradermal reaction and relationship of the *M. melitensis* of Bruce to *B. abortus*, Bang. He thinks that we have at present no right to say that undulant fever is caused by *B. abortus*, but it is now well established that there is an undulant fever of bovine origin.

The species *melitensis* and *abortus* of genus *Brucella* comprise varieties and adaptations more numerous and less fixed than was believed, and the virulence of the human and bovine strains differs greatly. It is a remarkable fact that laboratory infections with the former have been very common, whereas with the latter none is known. Exact classification of the group is as yet impossible. Serologically it is possible in certain cases to state positively that an organism is *melitensis*, but it is not possible by the same methods to prove definitely that a strain is *abortus*; that is, there are certain definite *melitensis* strains but the others overlap; it is premature to say that they are identical. The similarity between *B. pestis* and *B. pseudo-tuberculosis* should be remembered, and the author holds that pathogenicity as a character is of great importance. He considers that *abortus* is closely related to *paramelitensis*, and he has found the latter to be easily recognized. Seven out of eight *abortus* strains tested, three-quarters of which were of caprine origin, he placed in the *paramelitensis* group. He believes that Brucella may be classified in two principal types, *melitensis* and *paramelitensis*, with *abortus* intermediate. For diagnosis he states that the agglutination test fails in 20 to 25 per cent. of undulant fever cases; the intradermic is very good but does not distinguish between the three groups. . Some remarks on the use of *abortus* for prophylactic and curative treatment with a record of the peculiarities of immunity transferred through the mother terminate a very interesting paper.

[*B. abortus* is shown by the flocculation test to join the *melitensis* rather than the *paramelitensis* group.]

P. W. B-S.

BURNET (Et.). **Différenciation des** *Paramelitensis* **par la floculation sous l'action de la chaleur.**—*C.R. Acad. Sci.* 1925. June 29. Vol. 180. No. 26. pp. 2085–2087.

The author found that when simple saline suspensions of *melitensis* and *paramelitensis* were heated in a water bath to 90°, a very rapid flocculation occurred with the latter but not with the former; hence a means of distinguishing between the two. Strains of *B. abortus* tested in the same way did not flocculate, differing thus from *paramelitensis.* Flocculation of *paramelitensis* varies in degree; the strains that showed it best were those that gave the *paramelitensis* characters most strongly. When a deposit is tested a second time the flocculation of the suspension is much more unstable, coming down at ordinary temperature in a few hours. Tested with anti-sera the agglutinability of *paramelitensis* is increased, that of *melitensis* diminished. If *melitensis* is cultivated in broth of *paramelitensis* killed by heat, the *melitensis* acquires the flocculation properties of the para. The author does not explain these results, but suggests that they conform with the conditions of agglutination of bacteria, that the flocculation by heat appears to be an extension of spontaneous agglutination, and is possibly due to alteration of the surface tension of the bodies. It is curious that *paramelitensis* shows (1) spontaneous agglutination; (2) flocculation by heat; (3) agglutination with non-specific sera; (4) it is feebly antigenic. He asks: have these a common cause?

[The reviewer has found this flocculation very definitely present in *paramelitensis* strains and not in *melitensis* and *abortus* strains in his possession.]

P. W. B-S.

BURNET (Et.). **Sur la notion de** *paramelitensis.*—*Arch. Inst. Pasteur de Tunis.* 1925. July. Vol. 14. No. 3. pp. 247–263. [11 refs.]

The author by systematic serum tests (human and animal) divided his 30 *melitensis* strains into two definite groups, varying in antigenic properties and producing different antibodies; *B. abortus* belongs to No. 1, though it is a subgroup of it. The observations on which these conclusions were founded are fully reported, but most of them have been stated in previous papers (abstracted); here the evolution of the facts is clearly and definitely recorded.

Stated shortly, it is possible to distinguish among the *melitensis-abortus* organisms, by agglutination and absorption tests, two groups, which are provisionally called i and ii. Group ii corresponds with those strains recognized as *paramelitensis.* This is a very real group: it possesses the characters (mostly antigenic) defined by BASSETT-SMITH, and heating an emulsion of the organism to 90° causes flocculation. It is not a *melitensis* organism which has become non-agglutinable. The serum of inoculated goats and rabbits is strongly specific and has little or no agglutinins for group i. These *paramelitensis* organisms are not rare, about 30 to 40 per cent. of strains in Tunis, and they are the cause of many diagnostic errors. The author thinks the terms para and pseudo should be dropped altogether.

P. W. B-S.

BURNET (Et.). **Sur le *paramelitensis* et sur l'emploi des termes paramelitensis, paratyphiques, paraméningocoques, etc., dans la nomenclature des bactéries.**—*C.R. Soc. Biol.* 1925. July 10. Vol. 93. No. 24. pp. 340–342. [1 ref.]

As is well known, the term *pseudo-* or *para-melitensis* has been used for a definite variety of the *melitensis* group, which was described by Ed. SERGENT, NÈGRE and RAYNAUD, and others. The first human case was observed in 1912 by BASSETT-SMITH, who recognized in the organism the following characters:—(1) More bacillary in character than *melitensis*; (2) more agglutinable by non-specific sera; (3) greater tendency to auto-agglutination; (4) produces less specific agglutinin and to a less titre in rabbits than *melitensis*. To these characters the author adds the flocculation test at 90° C. (see above).

That there is such an organism is generally accepted, and it has to be tested for serologically in all cases. Of 35 strains examined by the author at Tunis 14 belonged to the *paramelitensis* group. (It is common in goats.)

He would prefer to drop the prefix, as the differences on which the variety is separated are almost entirely serological, and cannot compare with those of typhoid and paratyphoid, but rather correspond with those of the Meningococcus and Pneumococcus 1, 2, 3, and 4. He would have *melitensis* 1, 2 and drop para and pseudo altogether, as this terminology would be more in accordance with scientific language.

[The method suggested would be welcomed, but the position of *B. abortus* is not clear. One gathers that it would fall in group 1, which would then be an anomaly, as some *melitensis*, according to the author's own showing (and that of others), can be definitely separated from all the other *melitensis-abortus* group.]

P. W. B-S.

TRENTI (Enrico). **Il valore della intradermoreazione nell' infezione melitense.**—*Policlinico.* Sez. Prat. 1925. June 1. Vol. 32. No. 22. pp. 767–770. [5 refs.]

The author tested BURNET's intradermal reaction in 9 cases of undulant fever and 70 patients suffering from other conditions, and found that it gave specific results. Others having recorded a positive also in some cases of tuberculosis, the author repeated his tests with 4 undulant fever patients and 40 others, 30 of whom were suffering from some other disease and 10 were healthy. He used 0·1 cc. of a filtered broth culture, 20 days old. That the four were definite instances of undulant fever was proved by blood culture and by agglutination, and he obtained absolutely specific results in all of them with one of the strains used. To other strains the reactions were irregular. It is worthy of special note that the agglutination and intradermal tests do not go hand in hand. Thus, a patient's serum might agglutinate a certain strain of *M. melitensis*, but the cutaneous reaction with the filtrate from that strain might be negative and *vice versa*. It is well, therefore, to employ the mixed filtrates from several; the author himself uses six.

H. Harold Scott.

Ponticaccia (Luigi). **Infezione umana da bacillo di Bang o nuove fonti e vie di contagio della febbre maltese ?**—*Giorn. di Clin. Med.* 1925. Apr. 30. Vol. 6. No. 6. pp. 218–224.

The author reports one case in detail and another briefly in which the symptoms were those of undulant fever and the disease ran a typical course, although this infection was unknown in the district. The first was a doctor who made a vaginal examination of a cow which had just aborted. Three days later one of the phalangeal joints of the right hand became swollen ; pus formed and the symptoms, subjective and objective, of the subsequent febrile condition were indistinguishable from undulant fever. His serum agglutinated two strains of *M. melitensis* up to 1 : 1,000 and 1 : 800, and strains of Bang's bacillus in dilutions of 1 : 1,000, 1 : 2,000 and 1 : 4,000.

Cases reported by others are referred to and the question of diagnosis is discussed. The author was not able to confirm the statement of Ficai & Alessandrini as regards the relative thermostability of *abortus* agglutinins. [See this *Bulletin, ante,* p. 511.]

[The onset three days after the examination points to a mild infection with some pyogenic organism as well as the *B. abortus.*—P. W. B-S.]

H. Harold Scott.

Polettini (Bruno). **Ulteriore contributo allo studio dei rapporti fra** " *Micrococcus melitensis* " **e** " *Bacillus abortus* " **(Bang).**—*Pathologica.* 1925. May 1. Vol. 17. No. 395. pp. 241–242. [2 refs.]

The author suggests, on the lines of his previous work with the typhoid-paratyphoid group of organisms, that the anaphylactic reaction—injecting dried cultures of the bacteria of undulant fever and contagious abortion—may be used for differentiating the two. The use of the test, however, appears to be of dubious value since in the experiments detailed the reaction was obtained not by the strain of *B. abortus* used for the previous sensitizing injections but by a strain of *M. melitensis.*

H. Harold Scott.

Bastai (P.) & Cerruti (C.) [**Sulla epidemiologia della febbre maltese : Bac. di Bruce o bac. di Bang ?**]—*Minerva Medico.* 1925. Apr. 20. Vol. 5. No. 11. [Summarized in *Bull. Inst. Pasteur.* 1925. Aug. 15. Vol. 23. No. 15. p. 657.]

From the facts reported by Ficai & Alessandrini, the authors draw the deduction that *M. melitensis* is pathogenic for cattle and pigs, and is able to cause abortion in cows and sows. [F. & A. state that melitensis and abortus are strictly specific, and can be distinguished clinically, morphologically, biologically and serologically, *ante.* p. 511.] The authors note that : (1) The serum of tubercular cattle does not agglutinate either melitensis or abortus ; (2) the anti-abortus agglutinins are not more resistant to heat than the antimelitensis. [Again at variance with F. & A.]

P. W. B-S.

BUCK (John M.). **The Differentiation of Primary Isolations of *Bacterium melitensis* from Primary Isolations of *Bacterium abortus* (Bovine) by their Cultural and Atmospheric Requirements.**—*Jl. Agric. Res.* Washington. 1924. Dec. 15. Vol. 29. No. 12. pp. 585–591. [24 refs.]

By a careful study of *primary* cultures from experimentally infected guineapigs the author finds that *B. abortus* (bovine) when grown on serum agar in an atmosphere with 10 per cent. CO_2 added, appears to develop more luxuriantly than in ordinary air, and that the colonies are easily distinguished from those of *B. melitensis* grown under the same conditions; with this latter organism no difference was noted under the two different atmospheres. The work of previous investigators is freely quoted, and the author states that the strains hitherto used have mostly been old and much subcultured.

[The reviewer has always found that in primary cultures *M. melitensis* is definitely coccoid and not bacillary, justifying the original designation "micrococcus."]

P. W. B-S.

RODRIGUEZ DE PARTEARROYO (Francisco). **Reacciones ganglionares en la melitococia.**—*Siglo Méd.* 1925. July 18. Year 72. Vol. 76. No. 3736. pp. 53–56. With 4 charts in text.

Brief records of two cases of undulant fever, one of them contracted accidentally from a culture. In both, a painful adenitis yielded to injections of a *M. melitensis* vaccine.

H. Harold Scott.

PASERO (P.). [**Syndrome emorragica nella febbre di Malta.**]—*Rivista Ospedaliera.* 1924. No. 18. [Summarized in *Bull. Inst. Pasteur.* 1925. Aug. 15. Vol. 23. No. 15. p. 660.]

Six cases in a family were attacked with undulant fever. In four the diagnosis was proved by serum reactions and in one there were marked enlargement of the liver and haemorrhagic complications.

P. W. B-S.

DENGUE AND UNCLASSED FEVERS.

SILER (J. F.), HALL (M. W.) & HITCHENS (A. P.). **Results obtained in the Transmission of Dengue Fever.**—*Jl. Amer. Med. Assoc.* 1925. Apr. 18. Vol. 84. No. 16. pp. 1163–1172. With 3 charts in text. [3 refs.]

In Manilla from July 24th a series of experiments was made on 42 American soldiers (volunteers) to determine the transmission of dengue by means of mosquitoes; the men were in screened wards and the mosquitoes were bred from the egg. In 83 biting experiments made by infected females of *Aëdes egypti* dengue was transmitted 25 times. The positive results were 60 per cent. All experiments with *Culex fatigans* were negative. The virus is present only during the first three days of the fever, and requires at least 11 days to develop in the mosquito before it can be transmitted, the insect thereafter remaining permanently infective. Fifty-eight per cent. of those who had suffered from the disease were immune, and in the remainder the course was modified.

These results are in striking similarity with those observed in yellow fever and suggest strongly some group relation, but in yellow fever the immunity produced is much more definite.

The work was apparently very carefully planned and carried out and full details are given, with charts.

P. W. Bassett-Smith.

BIDEAU. **Une épidémie de dengue avec complications à bord de l'aviso Antarès.**—*Arch. Méd. et Pharm. Nav.* 1925. Apr.–May–June. Vol. 115. No. 2. pp. 107–136.

An epidemic of dengue which lasted two months occurred on board the warship "Antarès," between Dakar and Bahia; the first case was notified before arrival at Bahia. The ship had been at Dakar for three weeks, of which three days were spent in the dock, and it is stated that there was no dengue there at the time. The epidemic probably originated in dock when mosquitoes were abundant; none were found on board after three days at sea or after arrival at Bahia.

The cases were at first mild, but later became more severe and were very like malaria. Eighty-five out of a crew of ninety-seven were affected, and forty-three were sent to hospital with gastro-intestinal symptoms and, rarely, jaundice. There was marked leucopenia, but no parasites were found in the hospital cases; among these there was one death. Full details of the cases are given and the diagnosis was dengue modified by the climate.

P. W. B-S.

RODRIGUEZ ARJONA (Vicente). **Contribución al estudio de las enfermedades tropicales. Enfermedades endémicas de Yucatán. El dengue.**—*Rev. Yucateca de Dermat. y Parasit.* Merida, Yucatán. 1925. May 15. Vol. 1. No. 1. pp. 2–12. With 2 text figs.

A general description of dengue based upon personal observations of a widespread epidemic in Yucatán in 1917, but bringing forward no fresh facts.

H. Harold Scott.

PATRIK (N. P.). **"250 Cases of Febris Pappataci."**—*Russian. Jl. Trop. Med.* 1924. No. 4-5-6. English summary p. 121. [In Russian.]

The author notes that 250 cases of sand fly fever occurred in the Russian Army in the district of Urmia in Persia during the Great War, and gives a clinical account of several cases.

P. W. B-S.

NORMAN (C. E. S.) & RAMACHANDRAN (C. S.). **A Case of Tick Typhus.**—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. p. 222.

The clinical symptoms are described in detail. There was every probability of the patient having been bitten by ticks but no absolute proof; as far as could be seen lice were excluded. It is stated that the spots could still be seen three weeks after the patient was discharged. The blood gave a strong positive Wassermann and negative Weil-Felix. No temperature chart is given.

P. W. B-S.

FLETCHER (William) & LESSLAR (J. E.). **Tropical Typhus in a Training Camp.** [Abstract.]—*Monthly Bull. of the Eastern Bureau.* Singapore. (League of Nations, Health Section.) 1925. Apr. 20. Year 1. No. 1. pp. 21–22.

In the Malay States there is a typhus-like fever similar to that described in India, China, Australia, and Mexico, which is sporadic, little-infective and is not carried by lice. The authors cite five cases which occurred in a British regiment at Kuala Lumpur between 9th Oct. and 7th Nov. 1924. In all the cases the Weil-Felix reaction was positive at a higher dilution than 1/200, and recovery was complete. Three days after the regiment left the camping ground a Tamil cowherd and, a few weeks later, two Punjabi carters were attacked. As the site of the camp was the principal grazing ground for cattle, tick transmission is possible, though not proved.

[The term "Tropical typhus" used by the authors is not as yet quite justified.]

P. W. B-S.

ANDERSON (G. V. W.). **Notes from Several Cases of Pseudo or Para Typhus.**—*Kenya Med. Jl.* 1925. May. Vol. 2. No. 2. pp. 42–48. With 1 chart.

In Kenya Colony a peculiar disease called "Spotted Fever" has been known for 12 years. Only one death has been reported, and this case suggested Brill's disease. Sporadic cases occur every year, most frequently in or about the rainy seasons, and never below an elevation of 5,000 feet. The onset is sudden, the course prolonged (8–16 days), the pulse is invariably slow relatively to the fever, and pains are generally severe. The rash, which is preceded by a temporary generalized erythema, comes out about the 5th day as a crop of papules, and continues erupting to the 10th or 11th day. It is widely distributed on the body, limbs and face, rarely on the scalp, and remains visible for 7–11 days after the fever has passed. Petechiae may be present. The spleen is slightly enlarged. The blood shows a leucocytosis, and an increase of the red cells with high colour index. Clinical notes of three cases are given.

P. W. B-S.

i. CLEARKIN (P. A.); ii. CLARKE (J. B.). **So-called Pseudo-Typhus.** [Correspondence.]—*Kenya Med. Jl.* 1925. Apr. Vol. 2. No. 1. pp. 28–29; May. No. 2. p. 54.

i. Stimulated by BALFOUR's recent article on pseudo-typhus, the author draws attention to the fact that the disease has been known at Nairobi for some years; it was often called dengue, but was recognized by ANDERSON. The author suggests cross immunity experiments to determine whether it is true typhus or not.

ii. It is stated that a case of this disease at Nairobi exactly resembled, clinically, the typhus seen in Mesopotamia. The author, with Clearkin, deprecates haste to invent a new disease until the possibility of its being an old one has been excluded.

P. W. B-S.

SLOT (J. A.). **Een geval van vlektyphus.** [A Case of Typhus Fever.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 267–274. With 1 chart in text.

A case of pyrexia of 10 days' duration, showing a petechial rash, in a Javanese at Sourabaya, is (after exclusion of other possible diagnoses) considered to be an isolated case of typhus fever on account of the clinical picture (which was, however, complicated by icterus), and a 1 : 400 positive Weil-Felix reaction. [Pyrexia of unknown origin being still common enough in the tropics, and in view of the facts that typhus fever has never been reported in the Dutch East Indies, and that nothing is known of possible influence of tropical diseases or other tropical influences on the results of the Weil-Felix reaction, this conclusion appears to the annotator to be subject to some doubt.]

W. J. Bais.

DE MELLO (F.), BRAS DE SÁ & COLOPO (G.). **As febres remitentes de Gôa são contagiosas e provocam epidemias.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Sept. 9th Ser. No. 9. pp. 373–383.

This is an interesting paper adducing much evidence to controvert the widespread idea that the "remittent fever of Gôa is non-contagious." By clinical observation and by bacteriological examinations it was shown that some at least of these cases are definitely enteric fever. The author has succeeded in tracing from one to another a local epidemic of 13 cases in the college of Arporá, each of which had been diagnosed as an isolated instance of "gastric fever." He next shows that several cases have occurred in the same household, 5 in two instances, 6 in another, 7 in a fourth. Finally, a series of 8 cases in Nachinolá, also reported as suffering from remittent fever, proved to be infections with *B. typhosus.* Five of these were clearly traced, three to a single patient.

H. Harold Scott.

DE MELLO (Froilano) & BRÁS DE SÁ. **Origem das febres tifoides em Gôa.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Oct. 9th Ser. No. 10. pp. 397–408.

An analysis of the cases of typhoid fever occurring in Gôa was made on the lines of the work of Colonels HARVEY and GREIG in India.

The authors show that the curve of the rainfall bears a definite relation to primary cases in July and August, but that a secondary rise occurs in the later months of the year owing to carriers who contracted the disease in the summer. Two instances are recorded in which one case was the source from which 6 and 4 others respectively contracted infection.

H. Harold Scott.

DE MELLO (F.), BRÁS DE SÁ, & COLOPO (Gonopote X.). **Observações clínicas das febres remitentes de Gôa e sua identificação pelo diagnóstico Bacteriológico.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Nov. 9th Ser. No. 11. pp. 446–484.

Brief notes of 71 cases of "remittent fever" in Gôa. A former paper on the same subject has been already reviewed (*ante*, p. 124). 49 were proved to be typhoid fever by cultivation from the blood or faeces and by Widal's reaction, 3 were paratyphoid, 4 malaria; 11 were not diagnosed, but 8 of these at least were probably enteric, and one was a case of tuberculosis. In several the common mistake had been made of regarding the case as malaria and treating the patient with quinine until the continuance of the fever led to further investigation.

H. Harold Scott.

RISQUEZ (F. A.). **La epidemia de fiebre eruptiva en Caracas.**—*Gac, Med. de Caracas.* 1925. Mar. 15. Vol. 32. No. 5. pp. 65–66.

The author gives an account of an epidemic in Caracas in which he himself saw between 20 and 30 cases within a brief period. The symptoms were as follows: Sudden onset of fever to 40° C. or higher, with sore throat; a rash, usually morbiliform, on the trunk and limbs on the second day; on or about the fifth day articular pains involving the wrists, elbows, knees and ankles successively. The fever and pains subside in another five days, perhaps with a slight desquamation. The patients were practically all children. In two instances there were catarrhal symptoms, and the rash did not appear till the fifth day; in these also there was no sore throat. One case was complicated with otitis media; in none was there any albuminuria.

The condition is unlike scarlatina in the character and distribution of the rash, the absence of albuminuria and the desquamation. Except in the two cases, which were probably definitely measles, the symptoms differ altogether from those of this disease. The degree of fever and the severity of the sore throat are against a diagnosis of German measles. The author mentions "Fourth disease," but does not regard it as a clinical entity. On the whole, he is inclined to consider the epidemic as one of mild and atypical scarlatina.

H. Harold Scott.

TROPICAL OPHTHALMOLOGY: A REVIEW OF RECENT ARTICLES.—IV.*

THE EYELIDS.—PETERSON[1], writing on the etiology and treatment of symblepharon, states that four groups of the condition are met with in China, viz.: (1) The result of the introduction of irritants—caustics, native medicines, and caterpillar hairs; (2) the result of conjunctival inflammations, of which trachoma is the most frequent cause; (3) the result of penetrating injuries; (4) the result of xerophthalmia. He treats the deformity by the use of dermic grafts on stents of dental modelling wax after the technique of GILLIES. WILDER's principles are followed in the construction of the cul-de-sac; these are (1) early operation; (2) the dissection for the cul-de-sac is made as close to the tarsus as possible; (3) a larger graft is used than the area needs; (4) the dissection is carried right down to the orbital periosteum; (5) all scar tissue is removed.

THE CONJUNCTIVA.—WOLBACH & HOWE[2] state that they have found very marked keratinous changes in the epithelial cells of rats which were deprived of fat-soluble A, and suffered from xerophthalmia in consequence. The epithelial lining of the upper respiratory tract, including the whole of the nasal passages, larynx, trachea and bronchi, was affected. Similar changes were found in the genito-urinary tract—renal pelvis, bladder, seminal vesicles, epididymis, and prostate gland. The epithelial degeneration was preceded by atrophy. The thyroid, testis and paraocular glands showed a striking atrophy. The authors conclude that "deprivation of the anti-xerophthalmic vitamin (fat-soluble A) affects specifically epithelial tissues. This effect is manifested in cells having presumably widely different chemical (secretory) function, and terminates in the complete loss of specific function and the transformation into a common type of chemically inactive (non-secreting) epithelium."

OKAMOTO[3], experimenting on young rabbits deprived of vitamin A, found that exposure to ultra-violet rays failed to prevent the development of xerophthalmia. Fresh vegetables or cod liver oil given by the mouth protect the animal against the eye disease; but glycero-calcium-phosphate fails to do so. Xerophthalmia differs from rickets in this respect.

SCHIMKIN[4] is of opinion that the Koch-Weeks bacillus is chiefly responsible for the epidemics of conjunctivitis which occur in Haifa during the summer. Koch-Weeks conjunctivitis is more common in Palestine than gonococcal conjunctivitis. He remarks that the inflammation caused by the Koch-Weeks bacillus renders the conjunctiva liable to be attacked by trachoma; and the combination of the two diseases produced specially grave corneal complications.

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* For the third of this series see above, pp. 446–452.

[1] PETERSON (R. A.). The Etiology and Treatment of Symblepharon.—*China Med. Jl.* 1925. Apr. Vol. 39. No. 4. pp. 309–313. [4 refs.]

[2] WOLBACH (S. Burt) & HOWE (Percy R.). The Epithelial Tissues in Experimental Xerophthalmia.—*Proc. Soc. Experim. Biol. & Med.* 1925. Apr. Vol. 22. pp. 402–403. [1 ref.]

[3] OKAMOTO (Takashi). Studies on Experimental Xerophthalmia.—*Japan Med. World.* 1925. July 15. Vol. 5. No. 7. pp. 180–183.

[4] SCHIMKIN. A Contribution to Epidemiology of Eye-Diseases in Haifa.—*Harefuah.* Jerusalem. 1925. Apr. Vol. 1. No. 4–5. English summary pp. VIII–IX. [In Yiddish pp. 194–206. With 9 text figs.] [12 refs.]

CHOU[5] reports that he has obtained excellent results from milk injections in the treatment of gonorrhoeal ophthalmia. On admission, 5 to 10 cc. of boiled milk is injected into the gluteus muscle of the patient. The injection is repeated on the second day and then omitted for a day, but given again on the fourth and fifth days. Fresh milk is boiled for 10 minutes and the fat is skimmed off; the milk is allowed to cool to body temperature and is then injected slowly. Local treatment is, of course, employed in addition. Some pain may be experienced at the site of injection.

MARTIN[6] reports a case of *tularemic infection of the conjunctiva* in a man who, whilst skinning a recently-killed wild rabbit, rubbed his hand across his eyes. Twenty-four hours later he was attacked by fever associated with an inflammation of the eyelid. A week later a large ulcer on the conjunctival surface of the lower lid and several smaller ulcers, free from induration, on the upper lid were seen. The eye was much inflamed and a small abscess formed at the inner canthus. The preauricular and cervical glands were painful and enlarged, but did not suppurate. The injection of pus, obtained from the lid-abscess, into guineapigs produced in them characteristic lesions. Agglutination tests, which were negative five days after the infection, were found to be positive on the seventeenth day.

TRACHOMA.—TRAPESONTZEVA[7], having studied smears and sections of trachomatous tissue, concluded that proliferation is as marked a feature in the reaction of the cells to trachoma as is any alteration in quality. The goblet-cells show marked changes. These cells are a normal constituent of the membrane, and are chiefly found in the culs-de-sac. Cell inclusions commonly form in the goblet cells as a result of a chronic irritation and first occur as granules of albuminoid matter in the mucus after the cell has undergone hyperplasia. The inclusions may assume a variety of shapes—crescents, etc., and, when present in quantity, signify the approaching destruction of the cell. These inclusions, of which the Prowazek bodies are an example, are in no way peculiar to trachoma. The author states that the central portion of the young trachomatous follicle is devoid of blood-vessels; the cells are consequently liable to necrosis. Polynuclear leucocytes are not usually found to any extent in uncomplicated trachoma, and, their presence signifies a secondary infection. The same writer[7a] has observed that the deep surface of the nictitating membrane of the dog frequently shows a development of follicles and papillae. Infective material from the eye of an untreated trachomatous patient was instilled into the eye of a dog, and eight days later signs of inflammation with follicle formation were seen on the deep surface of the membrane. A month after the inoculation the inflammation had faded away. Sections of the tissue showed characteristic pathological changes. It is suggested that the existence of this "*corps papillaire*" may render the dog a more favourable subject for experimental trachoma than has been supposed hitherto.

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[5] CHOU (C. H.). Gonorrheal Ophthalmia.—*Nat. Med. Jl. China.* 1925. June. Vol. 11. No. 3. pp. 151–157. With 2 text figs.

[6] MARTIN (Ancil). Tularemia Infection of Conjunctiva (Case Report).—*Southwestern Med.* 1925. June. Vol. 9. No. 6. p. 232.

[7] TRAPESONTZEVA (C.). De certaines causes d'erreur dans l'étude histologique du trachome. (Note préliminaire.)—*Arch. Inst. Pasteur de Tunis.* 1925. July. Vol. 14. No. 3. pp. 288–301.

[7a] ——. De l'appareil folliculaire des chiens et de son importance pour l'étude expérimentale du trachome. (Note préliminaire.)—*Ibid.* pp. 302–308.

SHOJI[8] claims to have discovered a special spirochete in trachomatous material, and he considers that trachoma is caused by a spirochetal infection.

WADA[9] believes that the use of polluted water is an important factor in the spread of trachoma in Kwangtung.

DE WAAL[10] recommends subconjunctival injections of cyanide of mercury for trachoma. He claims the following advantages for the treatment: (1) It is simple and can easily be administered by the general practitioner ; (2) it may be used in polyclinical treatment ; (3) it is of short duration ; (4) it is not very painful ; (5) there are no untoward sequelae ; (6) it is inexpensive. He repeats the injections every five or seven days.

BARBIERI[11] states that trachoma has been introduced into the Argentine by immigrants, chiefly by Italians, Spaniards, Turks, Arabs and Russians. It is now widespread, but is a serious menace in certain provinces only. The efficient examination of immigrants, with the rejection of infected persons and the compulsory treatment of trachomatous persons, is recommended. Care, too, should be taken to isolate and to treat infected children in the schools.

The *Revue du Trachome* for April, 1925, records the proceedings of the meetings of the scientific section of the *Ligue du Trachome* in November, 1924, and March, 1925. A. TERSON[12] reviewed the therapeutic measures usually employed in the treatment of trachoma, and described the technique, used by his father, of jequirity applications in cases of severe pannus. Subsequent speakers remarked upon the improvement in such cases which often followed on an attack of purulent ophthalmia, facial erysipelas, or the use of milk injections ; this being due, of course, to an alteration in the lymph circulation. ABADIE[13] stated that DE WECKER, under whom he had studied, sometimes obtained excellent results with jequirity, but finally was forced to abandon the use of the drug as he found it so difficult to control the violent reaction it produced. J. SEDAN[14] reported finding children in two different families to be infected by their trachomatous nurses, and he pointed out how important it is to ensure that the eyes of attendants on children are free from infection. LUSSICH-MAKTOVITCH[15] observed some cases of auto-infection in soldiers during the war. He stated that the first signs of the trachoma always appeared in the

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[8] SHOJI (Matasaburo). [On the Causative Agent of Trachoma as it is seen from the Viewpoint of Spirochetosis.]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. Nov. No. 2397. [Summarized in *Japan Med. World*. 1925. Feb. 15. Vol. 5. No. 2. pp. 41–42.]

[9] WADA (H.). A Probable Factor in the Spreading of Trachoma in Kwantung. —*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. May. No. 242. English summary p. 3. [In Japanese.]

[10] DE WAAL (E.). Behandeling van trachoom met subconjunctivale injecties van kwikcyanide.—*Geneesk. Tijdschr. v. Nederl.-Indië*. 1925. Vol. 65. No. 1. pp. 41–49.

[11] BARBIERI (Antonio). Le trachome dans la République Argentine.—*Bull. Office Internat. d'Hyg. Publique*. 1925. Apr. Vol. 17. No. 4 pp. 356–374. [9 refs.]

[12] TERSON (A.). Quelques éléments techniques de la cure du trachome.—*Revue du Trachome*. 1925. Apr. Vol. 2. No. 2. pp. 61–69. With 5 text figs. [12 refs.]

[13] ABADIE : discussion of Terson.—*Ibid*. pp. 69–70.

[14] SÉDAN (Jean). Sept cas de contagion trachomateuse infantile du fait de "nurses."—*Revue du Trachome*. 1925. Apr. Vol. 2. No. 2. pp. 72–75. [1 ref.]

[15] LUSSICH-MAKTOVITCH : discussion of SEDAN.—*Ibid*. p. 76.

plica semilunaris, and spread to the superior cul-de-sac in the second week after the inoculation. In very rare cases the infection remained limited to one eye. Dragoutine KOSTITCH[16] found the incidence of trachoma to be 14·2 per cent. amongst 6,000 patients treated in the ophthalmic clinic at Belgrade.

In the *Revue* of July, 1925, MORAX[17] states that he considers infantile contamination to be a more important factor than adult infection in the dissemination of trachoma. If the mother is trachomatous, her children rarely escape the disease, even though they may be only infants. The chronic nature of the disease is an aid to diagnosis, and he says trachoma may remain latent and infective throughout a long period. COLLIN[18] strongly advocates peritomy as a treatment for pannus. He makes a thorough dissection and divides the entire thickness of the tissues. NIDA[19] reported the successful treatment by milk injections of a case of trachoma, complicated by a dangerous corneal ulcer, in a man aged 47. Only one eye was affected. 10 cc. of twice-boiled milk was injected intramuscularly about every six days. Some doubt as to the diagnosis of the disease was expressed by subsequent speakers. COLLIN[20], recording a high incidence of trachoma in South Annam, found that the disease was diminishing in those schools in which injection and treatment were efficiently carried out.

THE CORNEA.—WRIGHT[21] recommends the following treatment for large staphylomata of the cornea. A sclero-corneal trephining is first performed, and the collapsed, staphylomatous tissue is then cauterized. The electric cautery is applied so as to form lines radiating from the centre to the periphery of the area. Wright remarks how common it is to find that the posterior segment of the eyeball is perfectly normal, even though the corneal projection has reached a very large size.

MILLOUS & DONG-NGOC-DIEU[22] have noticed that corneal ulcers, especially those of the facetted and neuro-paralytic types, occurring in patients suffering from hookworm disease, frequently take a favourable turn after the intestinal infection has been successfully treated; and they have formed the opinion that such ulcers are often directly due to poisons elaborated by the parasites.

THE LENS.—A paper by CRUICKSHANK[23] deals with the subject of BARRAQUER'S operation of phakoerisis. Surgeons practising in the tropics are likely to experience difficulties when using the vacuum pump employed by Barraquer; the instrument may develop defects, or electric power may not be available. CRUICKSHANK states he found the mercury vacuum apparatus supplied by Messrs. Down Bros. to be entirely satisfactory. The article contains many useful hints on technique. In this operation, as in all others for the extraction of cataract, it is highly important to make a sufficiently large incision. The author rightly stresses this point, and demonstrates how too small a wound may lead to a turned section as well as to many other complications.

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[16] KOSTITCH (Dragoutine). Sur le trachome en Serbie.—*Revue du Trachome.* 1925. Apr. Vol. 2. No. 2. pp. 80–96. [18 refs.]

[17] MORAX (V.). L'étiologie du trachome fléau social.—*Revue du Trachome.* 1925. July. Vol. 2. No. 3. pp. 101–108.

[18] COLLIN. Un perfectionnement de la périectomie dans les pannus granuleux. —*Revue du Trachome.* 1925. July. Vol. 2. No. 2. pp. 108–111.

[19] NIDA. Un cas de trachome unilatéral compliqué d'ulceration cornéenne grave traité avec succès par galactothérapie.—*Revue du Trachome.* 1925. July. Vol. 2. No. 3. pp. 112–116. [7 refs.]

[20] COLLIN. Rapport sur l'inspection oculistique des écoles des provinces du sud Annam (Février 1925).—*Revue du Trachome.* 1925. July. Vol. 2. No. 3. pp. 118–122.

[21] WRIGHT (R. E.). Conservative Operative Treatment of Large Staphylomata of Cornea.—*Arch. of Ophth.* 1925. Jan. Vol. 54. pp. 55–57.

[22] MILLOUS (Pierre) & DONG-NGOC-DIEU. Ulcères de la cornée et uncinariose. —*Ann. de Méd. et de Pharm. Colon.* 1924. Sept.-Oct.-Nov.-Dec. Vol. 22. No. 3. pp. 408–411. [1 ref.]

[23] CRUICKSHANK (M. M.). Phacoerisis: Observations on the Technique, with a Report on 115 Consecutive Cases.—*Brit. Jl. Ophth.* 1925. July. Vol. 9. No. 7. pp. 321-351. With 21 text figs. [20 refs.]

DAVIS[24] claims that, by using injections of lens-antigen in 131 cases of cataract, he arrested the progress of the disease, and improved the vision in 86 eyes—65·64 per cent., and arrested the progress of the disease without any improvement of the vision in 36 eyes—27·48 per cent. The treatment failed to benefit 9 eyes—6·87 per cent. The treatment must be commenced early to be of any use. Cortical opacities alone are benefited, and no absorption of the lens nucleus occurs. O'CONNOR[25] has reported the successful treatment of cataract by lens discission in patients more than 25 years of age. Six of his patients were over 35 years old, one of them being 48. HARSTON[26] considers that an ocular tension higher than 25 mm. and lower than 18 mm., as recorded by a Schiotz tonometer, contraindicates extraction of the lens in its capsule. He concludes " There can be no question that the intracapsular method of extraction, when successful, gives the most brilliant result of any operation . . . On the other hand, I have not the slightest hesitation in affirming without fear of contradiction that the combined method, extracapsular extraction with iridectomy, is the safest of all methods." HARSTON prefers to employ capsulotomy forceps to rupture the capsule and uses novocaine and adrenalin to obtain anaesthesia.

MACPHAIL[27], speaking from an experience of about 17,000 operations for cataract, says that he prefers to perform an iridectomy and to rupture the anterior layer of the lens capsule with his knife as he passes it across the chamber. He considers the glare of the tropical sun to be a cause of cataract, as most of his patients come from hot, dry, inland regions. His statistics for the year 1923 showed a suppuration rate of 1·2 per cent.

KIRKPATRICK[28], discussing the question of primary cataract in South India, remarks that typical lamellar cataract is comparatively rare there. Cataract in some form was responsible for 12·5 per cent. of the admissions to the out-patient department of the Government Ophthalmic Hospital during three years, in which a total of 52,994 persons were admitted. With regard to senile cataract, the varieties met with at operation were: Swelling type, 57·6 per cent.; shrinking type, 33·9 per cent.; nuclear, 8·5 per cent. It is suggested that it is important, when considering the aetiology of primary cataract, to avoid the separate discussion of each variety of the disease, and to regard the condition as a degeneration of the lens cells induced by the local action of injurious influences at a time when the constitutional state is abnormal. In South India exposure to heat and glare is likely to damage the lens fibres, especially if the local resistance is lowered by the commonly existing conditions of (1) a diet which is badly balanced and deficient in vitamins, (2) gastro-intestinal disease and diabetes, (3) excessive in-breeding, (4) a high rate of syphilitic morbidity. Some of these conditions prejudice the health of the endocrine glands, and their effect is most likely to be felt at a time when the harmonious working of the endocrine system is disturbed by the gonad deficiency due to the onset of senility. Abnormal calcium metabolism seems fairly common in cataract patients, and it is possible that endocrine disturbances, especially of the parathyroid and thyroid glands, may play an important part in the constitutional cause of cataract. The outstanding features of the Madras operation for senile cataract are: (1) Preliminary capsulotomy; (2) irrigation; and (3) lid-control. Capsulotomy is performed with a Bowman's needle immediately before making the section.

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[24] DAVIS (A. E.). Serum and Lens-Antigen Extract Treatment for Prevention and Cure of Cataract.—*Arch. of Ophth.* 1925. Mar. Vol. 54. pp. 172–182.

[25] O'CONNOR (R.). Discission of the Lens after the 25th Year.—*Amer. Jl. Ophth.* 1925. Jan. Vol. 8. pp. 54–55.

[26] HARSTON (G. Montagu). The Choice of Operation in Extraction of Cataract. —*China Med. Jl.* 1925. Mar. Vol. 39. No, 3. pp. 199–203.

[27] MACPHAIL (James M.). Cataract Extraction. Notes on 17,000 Operations. —*Indian Med. Gaz.* 1925. Aug. Vol. 60. No. 8. pp. 357–361.

[28] KIRKPATRICK (Henry). Some Aspects of Primary Cataract.—*Trans. Amer. Acad. of Oph. & Oto-Laryngol.* 1924.

MACCALLAN[29], in a paper upon the technique evolved by him for cataract extraction in Egypt, describes the very careful preliminary treatment to which the patient is subjected. Special attention is paid to the elimination of oral sepsis. Preliminary capsulotomy, a small conjunctival flap, and a peripheral iridectomy after lens delivery, are the leading features of the operation. Cortical lens matter is washed out by an irrigator. Old patients with bronchitis and restless patients are found to remain quieter if they are placed in a deck chair after operation instead of being subjected to rigorous restrictions. Dark glasses are given between the sixth and tenth days. Secondary cataracts are often needled 10 days after the extraction. No operation is performed on a cataractous eye if its fellow is in a state of phthisis bulbi until the latter has been removed. This is a point whose importance is not always appreciated as much as it deserves to be. A form of juvenile cataract associated with anaemia is discussed; the principal causes of the anaemia are ankylostomiasis and bilharziasis.

Expulsive choroidal haemorrhage during cataract extraction.—Fortunately, in the experience of most surgeons, this most disastrous complication is but seldom encountered. (It occurred four times in a series of 2,731 cataracts operated upon in Madras.) CRUICKSHANK[30], however, reports that 30 cases occurred in 2,777 cataract operations performed during two seasons at the Shikapur clinic; and he attributes this high rate to a correspondingly high incidence of glaucoma. The routine use of the tonometer during the selection of cases for operation was followed by a striking reduction in the incidence of expulsive haemorrhage, only one case occurring in 1923 and three in 1924. The rule is made that, when the eye registers as high a tension as 42 mm. with a McLean's tonometer, the case is reserved for extraction with capsulotomy; and, when the tension exceeds 50 mm., an iridectomy is first performed, and this is followed by extraction in the capsule some three to twelve months later. JOHNSON[31] met with the complication on six separate occasions after having performed what seemed to him a perfectly-executed operation, either intra- or extra-capsular. This experience has led him to consider whether it would not be wise to couch the lens when the cataractous patient is old and suffers from arteriosclerosis and a high blood-pressure. This proceeding is unlikely to be regarded favourably by those surgeons who know the amount of hopeless blindness produced by the coucher in the East. Numbers of eyes are, of course, lost there through avoidable sepsis ; but, within a few months, glaucoma and degenerative changes claim a full 80 per cent. of those eyes which escape virulent septic infection.

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[29] MACCALLAN (A. F.). Cataract Extraction in Egypt.—*Lancet.* 1925. Sept. 5. pp. 491-493.

[30] CRUICKSHANK (M. M.). Choroidal Haemorrhage following Cataract Extraction.—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. pp. 213-217. [9 refs.]

[31] JOHNSON (G. Lindsay). A Plea for Reviving the Operation of Couching.—*S. African Med. Rec.* 1925. May 23. Vol. 23. No. 10. p. 209.

GLAUCOMA.—VERHOEFF[32] found mucin to be abundantly present in the vitreous of a number of glaucomatous eyes ; and he suggests that this mucin is derived from the epithelial cells of the posterior part of the ciliary body and from the anterior part of the pars optica retinae. Cystoid degeneration of the peripheral retina is a common senile condition, and a consequent excess of mucin in the vitreous may occur. This change is not confined to old age. He postulates the theory that, with increasing age, the anterior hyaloid membrane, and possibly the whole vitreous body, becomes less permeable, whilst more and more mucin is secreted into the vitreous. The decreased permeability causes retention of the mucin, and this in turn further decreases the permeability of the vitreous so that a vicious circle is established. The vitreous increases in volume and the lens is pushed forward. In certain eyes the process reaches a stage when the root of the iris is pushed against the ligamentum pectinatum, and the intraocular pressure then rises.

CELLULITIS OF THE ORBIT.—WRIGHT & TAYLOR[33] emphasize the importance of infective processes in the nasal sinuses as a cause of orbital cellulitis, and have found infection of the ethmoidal cells most liable to lead to invasion of the orbit. Syphilitic osteitis and periostitis with empyema is, perhaps, the commonest frontal sinus condition associated with orbital abscess. To explore or drain the outer aspect of the orbit, they recommend a curved incision through the outer third of the brow parallel with the orbital rim and a short distance outside it ; the incision is carried just below the outer canthus and over the malar bone right down to the periosteum. Access to the orbit is gained by raising the periosteum and the periorbital membrane. Incisions made parallel to the lower margin of the orbit should be avoided owing to their liability to be followed by ectropion. To explore the upper nasal quadrant, a curved incision is made from just below the inner end of the brow mesial to the supraorbital notch to a point mid-way between the attachment of the internal tarsal ligament and the middle line. It is, of course, necessary to deal with the source of the infection after the orbit has been drained.

OCULAR SPARGANOSIS.—COLLIN[34] reports 27 cases of this disease, in which the larval form of the *Dibothriocephalus mansoni* becomes encapsuled in the tissues. More than half the patients were women, and in about one-fifth both eyes were affected. Three main types were seen—palpebral, subconjunctival, and orbital. The last type is specially dangerous, as it is likely to produce a proptosis and lagophthalmos which may lead to destructive secondary changes. Puffy, hard, tender, bosses form, mostly on the outer third of the upper eyelid, and oedema is often present. Marked chemosis often develops over the area beneath which the worm lies encapsuled. Considerable pain is frequently experienced. The disease is treated by the excision of the fibrous nodule in which the worm is embedded; and several of such nodules may be present. COLLIN is unable to state how the infection may be propagated.

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[32] VERHOEFF (F. H.). The Pathogenesis of Glaucoma.—*Arch. of Ophth.* 1925. Jan. Vol. 54. No. 1. pp. 20–37.

[33] WRIGHT (R. E.). & TAYLOR (C. G.). Cellulitis of the Orbit.—*Indian Med. Gaz.* 1925. July. Vol. 60. No. 7. pp. 312–316.

[34] COLLIN (L.). La sparganose oculaire en Annam.—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.-Feb.-Mar.-Apr. Vol. 23. No. 1. pp. 20–33. With 1 plate.

MALARIA.—WORMS & PESME[35] report cases of retinal haemorrhages, optic neuritis, retrobulbar neuritis, and ophthalmoplegia occurring in malarial subjects which they consider were due to the protozoal infection. In some of the cases the eye trouble was preceded by attacks of herpetic and dendritic keratitis in the etiology of which malaria admittedly may play an important part.

GENERAL.—Professor SIDNEY RUSS and Sir ARNOLD LAWSON[36] have dealt with the susceptibility of nocturnal animals to ultra-violet radiation. RUSS, experimenting on naval men during the war, found that the acuity of their vision for distant and dimly-lighted objects could be increased by about 15 per cent. if their eyes were first flooded with very small intensities of blue and violet light. Attention was then directed towards the question of visual acuity under ordinary night conditions, and experiments were made in order to ascertain how transparent the eye is to different regions of the spectrum. These showed that the human eye is very absorbent of rays having a wave length shorter than about 3,000 Angstrom units. The eyes of nocturnal animals, on the other hand, especially of the owl and the tiger, were found to transmit rays of a much shorter wave-length; and it is suggested that this may possibly account for their ability to distinguish objects in the dark. LAWSON suggests that an extra susceptibility to ultra-violet radiation may be present in the eyes of those persons who possess an extra keenness of vision, and that the various gradations of keen sight shown by different people may to some extent be explained in this way.

The Report of the Madras Government Ophthalmic Hospital[37] for 1924 contains much information of value to all ophthalmic surgeons, especially to those engaged in tropical practice.

It is sad to read that, for financial reasons, the Government was obliged to restrict admissions, and that the number of operations for senile cataract fell from 1,613 in 1923, to 1,468 in the year under review in consequence. 3,951 in-patients and 23,430 out-patients were admitted, and 4,324 operations were performed during the year.

92·29 per cent. of the patients operated upon for senile cataract obtained a vision of 6/36 or better at the time of their discharge; 3·2 per cent. had a vision of less than 2/60. The rate of vitreous loss (1·9 per cent.) was remarkably low. Wright, the Superintendent of the Hospital, favours a complete iridectomy in all doubtful cases; but when the iris is light coloured, has a really good tone, and shows no tendency to be washed into the wound by the irrigator stream, he prefers the simple operation. Button-hole iridectomy after lens delivery is occasionally performed. The irrigator is used freely in nearly every case.

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[35] WORMS (G.) & PESME (J. L.). Complications oculaires du paludisme.—*Arch. Méd. et Pharm. Milit.* 1925. Apr. Vol. 82. No. 4. pp. 508–522. [27 refs.]

[36] RUSS (Sidney) with LAWSON (Arnold). The Susceptibility of Nocturnal Animals to Ultra-Violet Radiation.—*Proc. Roy. Soc. Med.* (Section of Ophthalm.). 1925. June. Vol. 18. No. 8. pp. 37–40. With 1 text fig.

[37] MADRAS. Administration Report, Statistics and Professional Report of the Government Ophthalmic Hospital Madras for the Year 1924. [WRIGHT (R. E.), Supt.]—25 pp. With 17 figs. on 3 plates. 1925. Madras: Supt., Govt. Press.

Sclero-corneal trephining continues to prove the most satisfactory operation for glaucoma. Wright remarks upon the importance of vitreous changes in glaucoma and asks: "What property of the disordered vitreous is it which in advanced cases re-establishes high tension almost instantaneously after its relief by evacuating the anterior chamber?" 2,288 cases of refraction error were dealt with. 803 out-patients suffered from trachoma, 703 from phlyctenular conjunctivitis, 79 from gonorrhoeal ophthalmia, and 5,424 from catarrhal conjunctivitis; 1,916 of these latter were due to the Koch-Weeks bacillus.

In association with the King Institute, investigations are being conducted upon ulcus serpens and trachoma.

An interesting reference is made to the comparatively rare occurrence of sympathetic ophthalmitis in the East. This rarity must be familiar to most ophthalmic surgeons who have Eastern experience. A record has been kept of those patients who might reasonably be expected to contract the disease; and 62 such have been noted since 1921; but so far not a single one has reported any trouble. Notes and illustrations, contributed by the members of the staff, of many interesting and unusual cases are included in the report.

H. Kirkpatrick.

HEAT STROKE.

Scaffidi (V.). **[Ricerche sperimentali sulla eziologia e patogenesi del colpo di sole.]** [Experimental Investigations on the Aetiology and Pathogenesis of Sun Stroke.]—*Arch. di Sc. Biol.* 1924. Vol. 6. p. 462. [Summarized in *Med. Sci. Abstr. & Rev.* 1925. May. Vol. 12. No. 2. pp. 147–148.]

Experiments were made on rabbits and guineapigs. The exhibition of an animal to the sun gives rise to symptoms of sunstroke when the radiations are capable of raising the body temperature to about 45° C. If the part exposed is the head the animals die when the endocranial temperature has reached 45° C., and the remainder of the body only 43°–44° C. If other parts of the body are exposed to the sun a similar rise of temperature occurs. The so-called sunstroke syndrome seems, therefore, chiefly due to a local over-heating. This is shown by control experiments in which a part of the body was over-heated in the dark. The results are, however, influenced by the *time employed in raising the body temperature and the conditions of the surroundings in which the experiments are carried out.*

J. H. Tull Walsh.

di Renzo (F.) & Amodeo (P.). **[Ricerche sperimentale sulla fagocitosi. Fagocitosi spontanea e valore opsonico nel colpo di calore.]** [Experimental Phagocytosis. Spontaneous Phagocytosis and Opsonic Value in Sunstroke.]—*Arch. di Sc. Biol.* 1923–4. Vol. 5. p. 98. [Summarized in *Med. Sci. Abstr. & Rev.* 1924. June. Vol. 10. No. 3. pp. 249–250.]

The phagocytic value is increased during experimental hyperthermia caused by immersion in hot water. This increase is due to the increased opsonic power of the blood-serum and to modifications of spontaneous phagocytosis. Both the opsonic index and the spontaneous phagocytosis become normal as soon as the body temperature has reached the usual level. In sunstroke the phagocytic value is reduced owing to a constant and prevalent diminution of the opsonic power of the serum. Sunstroke and experimental hyperthermia appear, therefore, to be two different pathological conditions.

J. H. T. W.

Petragnani (G.). **L'eziologia del colpo di sole.** [Aetiology of Sunstroke.] —*Arch. Ital. Sci. Med. Colon.* Tripoli. 1924. Jan. & Feb.–Mar. Vol. 5. No. 1 & 2–3. pp. 3–18; 33–44. With 4 figs. [25 refs.]

These two papers contain details of experimental work with white rats and guineapigs. Similar work has been done in many lands and noticed in this *Bulletin*; see Vol. 9, p. 168 (Puntoni); Vol. 13, pp. 308–309 (Koizumi); Vol. 16, p. 66 (Koizumi); Vol. 20, p. 67 (Richet fils).

J. H. T. W.

MISCELLANEOUS.

Rogers (Leonard). **Pathological Evidence bearing on Disease Incidence in Calcutta.**—*Glasgow Med. Jl.* 1925. Jan. Vol. 103. New Series Vol. 21. No. 1. pp. 1–27. [13 refs.]

The Finlayson Lectures of the Royal Faculty of Physicians and Surgeons, Glasgow. The conclusions of the first part of this fully documented paper are as follows :—

" 1. Both the post-mortem records and the vital statistics of Calcutta show that one-third of the mortality is due to tropical diseases, and two-thirds to those of world-wide distribution.

" 2. The age incidence shows four times as many deaths in persons over 50 years of age in the London as in the Calcutta post-mortems, and this proportion is the same when the purely tropical diseases are excluded from the calculation.

" 3. The Calcutta figures show a great excess over the London ones in deaths from septicaemia, tetanus, tuberculosis, lobar pneumonia, non-tubercular meningitis, and cirrhosis of the liver—the first, fourth, and fifth being caused by the streptococcal group of organisms, which are favoured by the high mean temperature and overcrowding in the houses.

" 4. The London series shows a marked excess in the case of circulatory diseases, especially in the case of rheumatic endocarditis and mitral stenosis secondary to it, which is nearly, if not quite, absent in Bengal ; and to a less extent in atheromatous disease including aneurysms, due to the age factor, as atheromatous changes have a very similar age incidence in different decades of life in both series, and afford no evidence of especially early degenerative arterial affections to account for the shorter life of the Bengal race, while cerebral haemorrhages are also much more frequent in the London series, also on account of the age factor.

" 5. The four-fold excess of cirrhosis of the liver in Bengal cannot be explained on the alcoholic theory of its causation, as that is a very small factor in India, but evidence is produced that it is secondary to chronic ulceration of the gastro-intestinal track, chiefly in the form of long-standing amoebic dysentery.

" 6. The Indian races in Bengal have a lower resisting power against many specific diseases, such as pneumonia, cholera, dysentery, tuberculosis, fevers, etc., which are the most frequent causes of death in them, than Europeans living in Bengal, which is the main cause, in addition to the prevalence of tropical diseases, in their low expectation of life ; and is probably due partly to low racial vitality, most likely associated with the custom of early child marriage, and partly to insanitary conditions."

This may be supplemented by figures and details of special interest. The author points out that for accurate information about disease incidence in India we must turn to the post-mortem records of the few medical colleges. Here 1,600 post-mortems made at Calcutta are analysed and compared with 1,000 medical post-mortems performed at St. Mary's Hospital, London. Table I shows the percentage of mortality in Calcutta due to tropical diseases, which, if half the cases of fevers of uncertain origin are added to the vital statistics column, amount to one-third of the total.

TABLE I.—PERCENTAGES OF TOTAL CALCUTTA MORTALITY DUE TO TROPICAL DISEASES.

Disease.	1,600 post-mortems.		Vital statistics, excluding children under 5 years.
Malaria	1·56	9·99	—
Kala azar	8·06		6·2
Plague	0·37		0·15
Cholera	9·69		9·0
Amoebic dysentery	5·69	10·5	
Bacillary dysentery	4·12		9·3
Doubtful forms	0·69		
Amoebic liver abscess	2·69		1·8
Infantile liver	—		2·4
Ankylostomiasis	0·19		—
Beri-beri	0·37		0·1
Leprosy	—		0·4
Total	33·43		29·35
+ Half-doubtful fevers ...	—		3·9
Total	—		33·25

In the vital statistics column children under five are omitted to make the figures comparable with the hospital returns, since few young children are brought for admission, and, on the other hand, the infantile mortality is enormous. Another table shows the age distribution in each series of hospital cases. In the Calcutta figures children up to 10 make 2·5 per cent., whereas in London they make 16·9, and at the other end of life whereas 32 per cent. in the London figures are over 50, only 7·7 are in this category at Calcutta. The Census figures are also given and show that whereas there is an excess of children under 10 in Bengal, over 50 the Bengal figure is half that of England, 8·35 against 16; *i.e.*, fewer persons survive.

TABLE III.—PERCENTAGES OF DEATHS IN THE MAIN GROUPS OF DISEASES.

Group.	London post-mortems.	Calcutta post-mortems.	Calcutta vital statistics, *less* children under 5 years.
General	6·1	9·23	9·5
Tuberculosis	13·4	21·93	21·5
Circulatory	20·3	10·50	5·4
Respiratory	16·8	27·13	48·7
Digestive	7·5	12·00	7·2
Urinary	8·6	6·35	1·8
Nervous	11·9	7·41	4·1
Malignant Disease ...	13·8	4·59	1·21
Remainder	1·6	0·84	—

Table IV is a further analysis of General Diseases and Tuberculosis.

TABLE IV.—PERCENTAGES OF GENERAL DISEASES INCLUDING • TUBERCULOSIS.

General Diseases.	London post-mortems.	Calcutta post-mortems.	Calcutta vital statistics.	
			All ages.	Over 5 years.
Anaemia	1·5	2·34	0·6	0·9
Leukaemia	1·7	0·27	—	—
Diabetes	0·7	0·18	0·4	0·6
Diphtheria	0·5	0·18	0·37	0·1
Septicaemia	0·5	3·00	1·07	1·2
Tetanus	0·1	2·05	6·04	1·1
Typhoid	0·3	1·21	2·2	2·9
Tuberculosis.				
General	3·5 } 5·9	3.09 } 4·13	—	—
Meningitis	2·4	1·04		
Pulmonary	5·4	16·10	14·00	20·4
Primary Intestinal	0·0	1·04	—	—
Peritonitis	0·8	0·05	—	—
Other focus	1·0	0·09	0·76	1·0
Total	13·4	21·93	14·76	21·4

Table IV shows diabetes to be much more common in London than in the Calcutta figures; this is due to the fact that the disease is rare in Calcutta amongst the very poor. Septicaemia shows a high rate in Calcutta, and tetanus is twenty times as common; of 906 tetanus deaths in the 1921 returns no less than 785 were in infants, nearly all due to infection through the umbilical cord. Attention is drawn to the typhoid figures, though the low London figure is partly explained by the fact that such cases are seldom admitted now to general hospitals. In 1900 typhoid was believed to be rare in natives of India.

Tuberculosis accounts for no less than 21·93 per cent. of the non-tropical Calcutta post-mortems against 13·4 in the London data, and the pulmonary form is three times as common; this is partly discounted by the less common admission of such cases in London, but the Health Officer's returns for Calcutta give an incidence of over 20. Primary intestinal tuberculosis is not rare in Calcutta; this, it is suggested, is due to infection of food by indiscriminate spitting.

Table V gives the figures for non-tubercular respiratory diseases and circulatory diseases.

Here the frequency of lobar pneumonia is shown to equal that of phthisis; no less than 70 per cent. of the cases occurred between the ages of 21 and 40; and the incidence was highest among the Hindus. Broncho-pneumonia gives fairly equal figures in the two series.

In *circulatory diseases*, on the other hand, the London figures are twice the Calcutta, attributable to the rarity or absence of rheumatic endocarditis and pericarditis in Bengalis. In 4,800 post-mortems in 37 years only one case was returned as rheumatic endocarditis, and in the pathological museum founded 100 years ago there is only one specimen from a Bengali subject. Pericarditis appears as more common in Calcutta than in London, 0·75 against 0·4; of 102 cases tabulated by the author only one was classed as possibly rheumatic, 74 being secondary to inflammatory condition of the lungs and pleura; the majority are pneumococcal. The incidence of valve disease also is different; in London mitral disease was the primary cause of death in 4·3 per cent. and aortic in 2·6, whereas in Calcutta the corresponding figures are 0·93 and 2·7; the comparative rarity of mitral disease is doubtless due to the rarity of rheumatic fever. Again, in London, the average age of death from mitral stenosis is 31·8 years, and that from aortic valve disease 51; but in Calcutta the corresponding ages are 30 and 32·3. The author explains the great difference of age in aortic valve cases by the Indian cases being of syphilitic origin and the London ones due in great part to the degenerative type of atheroma of later life. Mitral stenosis in Calcutta is probably also syphilitic. A consideration of the age incidence of atheroma did not show evidence of any material difference in the two series and certainly none of premature arterial degeneration in the Bengalis.

TABLE V.—PERCENTAGES OF SYSTEMIC DISEASES.

System.	London post-mortems.	Calcutta post-mortems.	Calcutta vital statistics over 5 years.
Respiratory—			
Lobar pneumonia	4·2	16·03	17·9
Broncho-pneumonia ...	6·1	5·80	13·9
Bronchitis	4·7	3·00	14·5
Pleurisy and empyema ...	1·2	1·30	0·2
Others	0·6	1·00	1·2
Total	16·8	27·13	47·9
Circulatory—			
Ulcerative endocarditis ...	2·6	1·50	—
Rheumatic endocarditis ...	3·7	0·00	—
Pericarditis	0·4	0·75	3·8
Aortic valve disease ...	2·6	2·73	—
Mitral valve disease ...	4·3	0·93	—
Atheroma	2·4	1·41	—
Aneurysm	3·2	1·59	0·09
Others	1·1	1·59	1·30
Total	20·3	10·50	5·19

Table VII gives the figures for digestive, urinary and nervous diseases. The enteritis figures are unexpected; the low Calcutta figure is explained by the small percentage of children admitted. However, gastro-enteritis is less common in Bengal than one would expect, and this is to be explained by the universal boiling of milk before use. The excess of cirrhosis in Calcutta cannot be explained by alcohol; the disease is frequent among very strict Mahommedans in the Punjab. The average age at death is 39·6, against 48 in Europe (ROLLESTON). When all the complications of the cirrhosis cases were tabulated it was found that in 25 to 30 per cent. dysentery had been present " usually in a chronic form or as scars of old dysenteric lesions," while the percentage of the total cases other than cirrhosis showing such lesions was only 8·8. It was concluded that the causative factor of cirrhosis in Bengal must be "toxic absorption through the portal circulation secondary to chronic forms of ulceration," and this is usually due to amoebiasis.

A. G. B.

TABLE VII.—PERCENTAGES OF SYSTEMIC DISEASES (*concluded*).

System.	London post-mortems.	Calcutta post-mortems.	Calcutta vital statistics over 5 years.
Digestive—			
Gastric and duodenal ulcers	2·1	0·92	—
Enteritis	2·0	1·42	4·1
Cirrhosis of liver	1·3	5·91	2·0
Others	2·1	3·75	1·1
Total	7·5	12·00	7·2
Urinary—			
Parenchymatous nephritis...	2·3	1·96	—
Granular kidney	5·4	3·46	1·7
Others	0·9	0·93	0·06
Total	8·6	6·35	1·76
Nervous—			
Meningitis (non-tubercular)	2·4	3·29	1·1
Apoplexy	6·2	1·96	2·9
Others	3·3	2·16	0·2
Total	11·9	7·41	4·1

RAMSAY (G. C.). **A Few Impressions on some Diseases of Assam.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting. Jorhat, 2nd Mar. 1925.* pp. 6–9.

Quoting FORSYTH to the effect that in many estates of Assam pneumonia causes 30 to 50 per cent. of deaths, the author finds that in over 90 per cent. of cases the coolie gives a history of habitually sleeping on the floor; among better class coolies sleeping on a charpoy the disease is much less frequent. The migrations of round and hook worms are another probable cause and chronic malaria disposes to the infection. Chronic malaria, on the other hand, seems to mitigate the effect of spironemal diseases, for tertiary syphilis is mild and parasyphilis rare. Of bacillary dysentery, which represents 95 per cent. of the dysenteries among coolies at Cachar, he writes that all the antitoxic serum is imported; it is frequently inert, perhaps from improper storage, and should be manufactured by the Government. Ascites and oedema occur in old bacillary dysentery cases, and are possibly due to some other toxic factor. There is need for research into the relationship of eye-flies to epidemic conjunctivitis and Naga sores. Equine filariasis also is touched on, and the need for maintenance of medical research by the Government of Assam, which has recently lost the contribution of Calcutta (Rs. 40,000) to the Research Institute at Shillong.

A. G. B.

KING (G. E.). **Kansuh and its Diseases.**—*China Med. Jl.* 1925. Jan. Vol. 39. No. 1. pp. 19–22.

Kansuh, in north-western China, with a population of 10,000,000, contains but one medical missionary centre—a fact that surprises and discomforts the author.

The climate of the province appears to be delightful; the summer temperatures rarely exceed 95° in the shade, and the summer nights are cool; the autumn is " almost perfect " ; the winters, though cold, are bright and sunny; the spring, however, is dusty. Anopheles is found in most places in the province, but malaria occurs only in the south-west. Kala azar cases are brought in from most parts, and respond well to tartar emetic. Syphilis is widespread, in nearly all its forms; a very large number of cases of optic atrophy is observed, in which no history of syphilis can be elicited. Tuberculosis, despite the climate, is one of the scourges of the province; the fact that during the cold winter nights people crowd round a kang, or brick stove-bed, without troubling about ventilation, ensures the spread of infection. Surgical tuberculosis is common, and so is tubercular peritonitis, although milk is not generally used. Anthrax occurs—a fact of importance, since there is a large export trade in skins and hides. During the last 10 years there have been two outbreaks of pneumonic plague in the higher plateaus, but bubonic plague seems to be unknown. Leprosy occurs among Tibetans and others in the vicinity of that people, often in the mixed form; nodular cases may be found living among the general populations, but in some districts lepers are cast out to live in caves among the hills. Smallpox, diphtheria, scarlet fever, measles, and whooping-cough are met with in populous centres. Typhus and typhoid are constant. Bacillary dysentery exists, but relapsing fever seems rare, and cholera is not known. Among parasitic diseases ringworm, favus, and itch are common; roundworm and threadworm are found, and among the Moslems tapeworm is prevalent. Hookworm has been searched for but never discovered. Kang-epithelioma, with secondary implication of the inguinal glands, is not infrequent; it can usually be removed, even after several years growth, without recurrence. Osteomalacia is prevalent among females. Opium is in very general use (but not morphia), the drug being smoked, eaten, or the ash eaten. The well-to-do who take opium seem to suffer little; among others the effect on lung and kidney " is most evident and distressing." The author, who has lived in the province for 10 years, finds the Chinese not so naturally phlegmatic and apathetic as is commonly supposed; their emotions are repressed rather than resigned, and neuroses, and particularly anxiety hysterias, abound among the population of Kansuh.

A. Alcock.

MONTGOMERY (Eustace). **On Some Diseases Intercommunicable between Man and Animals in East Africa.**—*Proc. Roy. Soc. Med.* (Section of Comparative Med.). 1925. Jan. Vol. 18. No. 3. pp. 5–9.

The following are the more important points of this suggestive paper:—

There occurs in East Africa, in jackals, and communicable to dogs and other animals, a disease having the symptoms of rabies and the accompaniment of Negri bodies, to the infection of which, as conveyed by bite of dog and jackal, native Africans appear to be naturally immune. A disease with similar ambiguous phenomena occurs [as is well known] in West Africa. [This *Bulletin,* Vol. 18, p. 287; Vol. 20, p. 31.]

In East African medical reports before 1920 *Taenia solium* was stated to be the prevalent tapeworm, although pork is not usually eaten there either by Europeans or by natives. In reports since 1920 *T. saginata* is mentioned as preponderant. If the diagnosis be accepted, it may be, the author suggests, that the cysticercus of *T. solium* can adapt itself to some animal other than the pig, *e.g.*, ox or goat.

Although striking instances of fatalities from eating cattle dead of anthrax have occurred among natives in East Africa, cutaneous anthrax appears to be both rare and mild there—*e.g.*, " in the Kenya records, between 1919 and 1922, 135 cases were diagnosed in man with only 6 deaths.

Malta fever appears to be rare in Europeans in East Africa, but it was observed by BRUCE (in 1910), in natives and in goats, in Uganda.

" Domestic animals have not been seriously considered as reservoirs of a trypanosome pathogenic to man ; but as critical inquiry becomes more possible their influence in this disease grows more apparent."

Glanders was introduced into East Africa during the war, but no case has occurred during the last eight years.

Foot-and-mouth disease occurs in a very mild form in animals, but the author cannot remember any instance of the infection in man.

SIMPSON has drawn attention to the affinity between rinderpest and smallpox in India, and the natives of Africa have noticed the similarity of the skin lesions.

LEISHMAN, commenting on the apparent diminution in virulence in East Africa of three so widely different diseases as anthrax, rabies, and foot-and-mouth disease, wondered if it could be attributable to any peculiarities of climate. RABAGLIATI mentioned how during the war camel-pox and camel-mange had been transmitted to attendants. With regard to the rabiform disease of East Africa, Henry GRAY made comparison of the pseudo-rabies or infectious bulbar paralysis, not pathogenic to man and generally ascribed to rats, which occurred in Austria, Hungary, and Roumania. In respect of the apparent immunity of man to foot-and-mouth disease in East Africa, CAMERON remarked upon the possibility of two distinct strains of virus suggested by Continental workers.

A. A.

STONES (R. Y.). **Notes on the More Prevalent Diseases in Central Kavirondo.**—*Kenya Med. Jl.* 1925. Mar. Vol. 1. No. 12. pp. 359–362.

In the Native Reserve in Central Kavirondo tuberculous adenitis is seen and tuberculosis of the lungs is common ; among 2,450 in-patients it occurred in 13 (=·5 per cent.), in 8 of whom tubercle bacilli were found. In the same series there were 2 cases of carcinoma, 2 of sarcoma, and 4 at least of Hodgkin's disease. Malaria is common. No gonorrhoea was seen. The observations on syphilis are noted elsewhere.

A. G. B.

EASMON (M. C. E.). **Conditions of Medical Work in a West African Bush Station.**—*Jl. Trop. Med. & Hyg.* 1925. Mar. 16. Vol. 28. No. 6. pp. 128–131.

The author has spent 11 years in bush stations on the West Coast and gives here a description of cases seen during 8 months at the medical station of Bo in Sierra Leone, in an area exceeding 2,000 square miles traversed by a railway. The people, climate and communications are described, and details are given of the medical personnel and buildings. 2,067 new cases were attended at the dispensary and 200 others were seen in private practice. Little of special interest was recognized. Ulcers, especially tropical ulcers, were the most common affections, and were even met with at the Bo School for chief's sons, where hygienic conditions are good. Tertiary syphilis and gonorrheal stricture were fairly common. Yaws was rare in the primary stage, and later could not be distinguished from syphilis. Bilharzia and ankylostome infections are present, " but do not seem to cause symptoms." Leprosy and phthisis are uncommon. Malaria is a common infection. Smallpox and chickenpox are frequent in Sierra Leone, but were not met with in this series. Filarial embryos were frequently encountered in the blood; clinical manifestations are rare. Dental caries and pyorrhoea were common. Creoles formed half the private practice, and two-thirds of them were females with diseases peculiar to women. No figures of frequency of disease conditions are given.

[A useful paper on the diseases seen at Freetown was published in 1914 by YOUNG (this *Bulletin*, Vol. 14, p. 232).]

A. G. B.

CASTELLANI (Aldo). **Observations on Some Diseases of Central America.** —*Proc. Roy. Soc. Med.* (Section of Trop. Dis. & Parasit.) 1925. Jan. Vol. 18. No. 3. pp. 2–11. With 4 text figs.

This is an interesting paper, though there is nothing new in it, except some preliminary remarks on a new type of mycotic stomatitis, and on a papular discoloration of the skin, common in natives of Jamaica. The subjects discussed are Guatemala onchocerciasis, myiasis, rhinoscleroma, alastrim, granuloma inguinale, dermal leishmaniasis, pineapple-estate pyosis, mossy foot, and red mite.

A. A.

NEWHAM (H. B.). **Diseases of Central America.** [Correspondence.]—*Jl. Trop. Med. & Hyg.* 1925. Mar. 2. Vol. 28. No. 5. pp. 115–116.

A brief account of diseases seen in British Honduras in 1923. Several cases of myiasis were met with, and from some of the maggots a species of Dermatobia was obtained. Cases of " bay sore " seen were probably leishmanial, but the parasite was not demonstrated. It commonly attacks the lobe of the ear and slowly invades the neighbouring tissues; recovery takes place with the loss of part of the auricle. The local injection of emetine was remedial. Pinta is prevalent. No case of onchocerciasis, as met with in Guatemala, was seen, and blood examination of 200 persons revealed no microfilariae.

A. G. B.

MULHENS [MÜHLENS] (P.). **Informe preliminar sobre estudios realizados en los territorios del Chaco y Formosa y en el Paraguay.**—*Semana Méd.* 1925. Mar. 19. Vol. 32. No. 12. (1627.) pp. 622–625.

A preliminary survey of the results of a journey through two provinces of northern Argentina and Paraguay. Amongst 200 blood-examinations in the districts of La Aurora and Basail only one was positive for malarial parasites, a case of quartan. Altogether, 378 were examined and 2 positives detected, one with crescents and one with quartan gametes. The time was not that of greatest malarial prevalence, but it is evident that in Resistencia and Formosa the endemic index of malaria is a low one, for many of these were children, and in two instances only could enlargement of the spleen be made out. In very wet years, such as 1921 and 1922, malaria was reported as " having taken on an epidemic form." No cases of trypanosome or filarial infection were encountered. 80 per cent. of the smears showed marked eosinophilia, and the cause of anaemia in Chaco, Formosa and Corrientes is hookworm rather than paludism.

To test whether " Bayer 205 " was of any prophylactic value against Mal de Caderas, 24 horses were injected (in January) with 1 gm. per 100 lb. body-weight and, with 19 others used as controls, were sent to Sante Fe. They suffered severely from want of proper food on the journey, and only 25 reached Loma Negra. Of the 18 that died, 8 had had the " 205." Examined in August, only one of the inoculated harboured trypanosomes. The general idea is that horses do not show symptoms till 2 years after introduction into the district. A case mentioned disproves this, since trypanosomes were discovered three weeks after arrival in the endemic zone.

The remarks on the other diseases met with are somewhat cursory. There were 20 lepers in the asylum at Corrientes, under treatment with chaulmoogra oil, but the results were not satisfactory [the method, dosage, etc., are not stated] ; in the leprosarium of Asunción antileprol (Bayer) is used and, it is said, with excellent effect. Cutaneous leishmaniasis is prevalent. In Paraguay there appear to be endemic foci of the disease, which in some parts becomes a veritable scourge, *e.g.*, in San Pedro. More than 7,000 cases have received treatment with tartar emetic for this condition " in recent years."

Anopheles, adult or larvae, were very rare ; their absence is ascribed partly to the prolonged drought, but more to the growth of Azolla in pools, ditches and lakes; where it was growing, larvae were never found. In Puerto Tirol there was no Azolla and larvae were in evidence ; all were *A. argyrotarsis*. The author recommends the use of this plant for malarial districts.

H. Harold Scott.

POLECK. **Ueber einige bemerkenswerte in unserer ehemaligen Südenseekolonie Samoa beobachtete Erkrankungen.** [Some Noteworthy Diseases observed in the Former German Colony of Samoa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 1 pp. 16–35.

The author practised in Samoa from 1908–1911 and records some of the conditions he met with during that time. First is described a " Six-day Fever," with shivering, backache, and some of the signs of dengue, but without the quiescent period and the distinctive rashes, though there is leucopenia of high degree together with increase of large mononuclears and eosinophiles. He concludes that it is a special entity occurring in the dry season, conveyed by *Culex fatigans*, and that one attack does not confer immunity.

" Samoa Pox " is next discussed. This is distinct from both variola and varicella. It is accompanied by a rise of temperature to 39·7° C., lasting for 4–5 days with slight remissions. There is no further rise with pustulation ; the pustules are not umbilicated, successive crops do not affect the temperature and there is no scarring. Subsequent vaccination is successful.

Thirdly, a condition bearing some clinical resemblances to enteric fever is considered. Blood culture for *B. typhosus* and *paratyphosus* was, however, invariably negative, as were also agglutination tests, and there was no leucopenia. He designates it " Pseudo-typhus," and suggests the agency of some such insect as the Kedani mite, since he found in some cases in Europeans an insect bite on the forearm associated with lymphangitis and lymphadenitis.

Another affection which was at first considered to be tuberculous in nature he believes to be streptothrix infection of the lungs. Tubercle bacilli were not found in the sputum, the loss of weight was but slight, and the general condition fairly well maintained, whereas tuberculosis in these islands runs as a rule a very rapid course. Further, guineapigs survived inoculation with the sputum.

Concluding paragraphs contain remarks upon some clinical aspects of filariasis and on skin diseases in general. The chief of these, late yaws lesions, tuberculosis, sporotrichosis and blastomycosis, receive cursory mention only. Although the inhabitants are engaged in the copra industry, copra-itch is not seen, and the author postulates a specific immunity of the native skin.

H. Harold Scott.

ROGERS (Leonard). **Pathological Evidence bearing on Disease Incidence in Calcutta.**—*Glasgow Med. Jl.* 1925. Feb. Vol. 103. New Series. Vol. 21. No. 2. pp. 95–114. [4 refs.]

Part II deals with tumours, innocent and malignant, and will, one hopes, give pause to the many who theorize on the origin of cancer.

Dr. F. L. HOFFMAN, consulting statistician to the Prudential Assurance Co., has concluded that the cancer rate is eight times as high among the 500,000,000 of civilized races as among the 1,200,000,000 of uncivilized races, including India. The author has collected data from 1,600 post-mortems at Calcutta, has microscopically examined 1,190 tumours, and has analysed a similar series of post-mortems and pathological reports at St. Mary's Hospital, London. A table shows that the post-mortem records give 45·9 per mille of malignant tumours in Calcutta and 138 in London, but the London series contains 4·8 times as many persons over 50 as does the Calcutta series, and three-quarters of the London cases were over this age. Taking this age difference into account the data show no greater incidence of cancer in England than in India, and lend no support to HOFFMAN. Table IX gives the incidence of the innocent tumours as shown by pathological examination, and the relative frequency of innocent and malignant tumours.

TABLE IX.—INCIDENCE OF THE COMMONER TUMOURS IN CALCUTTA AND LONDON.

	1,190 Calcutta Cases.		1,000 London Cases.
	No.	Rate per mille.	Rate per mille.
Innocent Tumours—			
1. Connective Tissue—			
Fibroma	75	63·0	29
Fibromyxoma	63	52·9	10
Myoma	118	99·1	55
Lipoma	10	8·4	35
Chondroma	8	6·7	3
Osteoma	5	4·2	2
Vascular	12	10·2	13
Total	291	244·5	147
2. Cysts—			
Ovarian and broad ligament ...	61	51·3	56
Breast	1	0·8	19
Thyroid	3	2·5	14
Dermoid	12	10·2	17
Hydatid	2	1·7	2
Others	31	26·0	22
Total	110	92·5	130
3. Epithelial (*a*) Papilloma—			
Of skin	24	20·2	29
Of mucous membrane... ...	16	13·4	36
Total papilloma	40	33·6	65
Epithelial (*b*) Adenoma—			
Breast	38	31·9	23
Prostate	5	4·2	27
Thyroid	0	00·0	37
Others	17	14·3	6
Total adenoma	60	50·4	93
Total epithelial	100	84·0	158
Total innocent tumours ...	501	421·0	435
Malignant tumours—			
Sarcomata	219	184·0	91
Squamous epithelial	240	201·6	208
Carcinomata	230	193·2	266
Total malignant epithelial	470	394·8	474
Total all malignant tumours	689	579·0	565

In both series the malignant outnumber the innocent, and the Calcutta malignants lead the London. An examination of the relative proportion of the two great classes of malignant tumours shows that the percentage of sarcomata was twice as great in Calcutta as in London, while for epithelial malignant tumours the Calcutta figure was five-sixths of the English, easily accounted for by the different age incidence.

Data of the innocent tumours may be obtained from table IX.

TABLE X.—INCIDENCE OF MALIGNANT TUMOURS IN CALCUTTA AND LONDON.

	1,190 Calcutta Cases.		1,000 London Cases.
	No.	Rate per mille.	Rate per mille.
1. Sarcomata—			
Round celled	131	110·0	23
Spindle celled	47	39·5	40
Polymorphic	14	11·8	9
Chondrosarcoma	5	4·2	4
Osteosarcoma	2	1·7	—
Melanotic	10	8·4	4
Lymphosarcoma	10	8·4	11
Total	219	184·0	91
2. Epithelial (*a*) Squamous—			
Skin	61	50·8	35
Lips	10	8·4	11
Cheek	12	10·2	8
Tongue and floor of mouth	23	19·3	60
Jaw	22	18·5	9
Throat and Larynx	4	3·6	20
Oesophagus	4	3·6	8
Penis	18	15·1	7
Vulva and vagina	6	5·0	4
Cervix uteri	80	67·2	18
Secondary in glands	—	—	28
Total	240	201·6	208
Epithelial (*b*) Glandular—			
Breast	81	68·0	152
Uterus	54	45·4	17
Ovary	28	23·5	12
Stomach	5	4·2	11
Liver primary	9	7·7	—
Gall-bladder	6	5·4	3
Large intestine	9	7·6	33
Abdominal	6	5·1	7
Kidney and suprarenal	2	1·7	5
Prostate and testicle	5	4·2	5
Others	25	21·0	21
Total	230	193·4	266
Total malignant epithelial	470	395·0	474
Total malignant all forms	689	579·0	565

Table X shows the incidence of malignant tumours in Calcutta and London. Of sarcomata the very malignant small round-celled sarcoma greatly preponderates in the Calcutta series. The true cancers are nearly equally divided between squamous and glandular epithelial forms. The latter are far less easily diagnosed than surface tumours, and are thus less likely to be recognized in uncivilized races. Among the squamous cancers note the prevalence of skin cases in Calcutta, though kangri-burn cancer was not met with. It is associated with common chronic forms of skin ulceration. The frequency of epithelioma of the jaw in the Calcutta series is held to be associated with the frequency of pyorrhoea. Epithelioma of the penis, twice as common in Calcutta as in London, is attributed to the accumulation of smegma beneath a congenitally phimosed prepuce. It is noted that the London series contains 28 per mille secondary squamose epithelioma in glands against none in Calcutta, indicating that here patients do not return for recurrences; but for this the Calcutta figures would be higher. The relative infrequency of breast cancer in Calcutta is attributed to absence of tight lacing and of firm corsets; the rarity of unmarried women may also be a factor. Cancer of the uterus and ovaries shows very high rates in Calcutta, all the more remarkable when the age factor is considered, but part of this excess is due to the large number of gynaecological beds in Calcutta Medical College Hospital as compared with St. Mary's. Important contributory causes are early marriage and the early onset of the menopause, and the fact that, as HOFFMANN'S statistics show, the cancer rate of the female generative organs rises greatly between 35 and 44 years, as against a later period for other regions. The relative freedom from cancer of the gastro-intestinal tract and especially the large intestine is considered to be due to the absence of irritation from hard faeces. Lastly, cancer of the liver and gall bladder call for consideration. These are much more frequent in Calcutta than in London. Tables are given of the percentages of gall-stones in centennial periods in Calcutta and London and of the frequency of cancer in gall-stone cases at the different age periods.

The paper ends with the following conclusions:—

"1. Malignant tumours, including both connective tissue and epithelial types, are about equally common in Bengal and England, with a slight excess in the tropical country, quite contrary to the statements of those who maintain that civilised races suffer eight times as much from them as uncivilised primitive peoples.

"2. Both innocent and malignant connective tissue tumours are considerably more common in Bengal than in England, while the reverse is the case with both innocent and malignant epithelial tumours; which supports the view that the innocent forms shade off into or may take on the characters of malignant ones.

"3. The slightly lower incidence in Bengal of the malignant epithelial tumours or carcinomata is fully explained by the age factor, as the higher rate in London is more than accounted for by the great excess of persons of the cancer age of over 40 or 50 years in England as compared with Bengal.

"4. Cancers of the tongue, oesophagus, stomach, large intestine, and breast show considerable excess in the London pathological examinations, while those of the skin, penis, both the cervix and body of the uterus, liver, and gall-bladder are in excess in India, nearly all of which are explainable on the known laws of long-continued irritation being the most important predisposing or exciting cause of cancer. This relationship is strikingly illustrated by the figures given, showing that gall-stones and cancer of the gall-bladder are rather more common in Bengal than in London, for it has been proved experimentally that the presence of gall-stones may induce cancer formation in this viscus.

"5. The three-fold excess of cancer of the uterus in Bengal is probably related to early menstruation, child-bearing and menopause in the Bengali race leading to earlier and more frequent development of cancer in them as compared with European females.

"6. In future, the onus will lie on those who proclaim the rarity of malignant growths in uncivilised races of proving their assertions by extensive and accurate pathological data, such as those on which the above conclusions are based, for about 90 per cent. of the Bengal population, who furnish a large proportion of the Calcutta hospital cases, live in villages under primitive conditions, and on a diet of natural foods."

A. G. B.

VAUGHAN (Kathleen). **Tar Cancer and the Kangri.** [Correspondence.] —*Lancet.* 1925. Sept. 12. pp. 495–496.

The writer notes that in the cases of kangri cancer which she has seen in Kashmir, " the tumour and the skin surrounding it, and the fold of the groin were begrimed with black, looking like soot or tar, which resisted soap and water." She suggests that this form of cancer is produced not by heat, but by the irritant tar, and states that one of the most popular form of fuel is pine debris washed down by the Sind River from the pine-forested hills.

A. G. B.

i. SAMBON (Louis Westenra). **Researches on the Epidemiology of Cancer made in Iceland and Italy (July–October, 1924).**—*Jl. Trop. Med. & Hyg.* 1925. Feb. 2. Vol. 28. No. 3. pp. 39–71. With 27 figs., 11 maps & charts.

ii. BAYLIS (H. A.). **On** *Gongylonema* **collected in Italy during October, 1924, with some Observations on the Genus.**—*Ibid.* pp. 71–76. [5 refs.]

iii. BLAIR (K. G.). **Some Notes on the Insect Intermediate Hosts of** *Gongylonema.*—*Ibid.* pp. 76–81. With 7 figs.

i. This paper, which is an amplification of one published in the *Journal of Tropical Medicine and Hygiene* for June 2nd, 1924, contains further observations regarding the curious localism of cancer in particular parishes, streets, and even houses (" cancer houses "), and a reiterated statement of the researches of BORREL (on the development of sarcoma round the cysticercus of *Taenia crassicollis* in the liver of rats), and of FIBIGER (on the production of carcinoma in the stomach of rats fed upon cockroaches infested with larvae of *Gongylonema*), upon which, mainly, the author bases his explanation of the causation of that disease. Briefly, the author is one of those who postulate the existence of a cancer organism, and the organism of his conjecture is a ubiquitous intracellular microbe, which attacks tissues of lowered natural resistance, and is furthered in its attack most commonly (but not exclusively) by parasites (chiefly parasitic worms, and particularly those of the genus *Gongylonema*) that themselves are usually disseminated as larvae by the common domestic insect pests (particularly cockroaches, but also cellar-beetles, mealworms, etc.) that contaminate food. Gongylonema " is only one of several animal parasites which may be concerned in the complex aetiology of cancer " ; among other possibles here mentioned are the three notorious species of Schistosoma, *Opisthorchis felineus,* Hepaticola, Capillaria, *Trichinella spiralis,* Physaloptera, *Oxyuris vermicularis,* Strongylus and Metastrongylus, *Muspicea borreli* (a new genus and species of nematodes from the mouse, here defined), and *Demodex folliculorum.* So far Gongylonema has been observed as a human parasite in only 5 (or perhaps 6) cases (4 in America, 1 (perhaps 2) in Europe), but it is an inconspicuous worm, and the author thinks that it must often have been overlooked.

The paper is a perfect pageant of erudition—varied and uncommon.

ii. Of the species of the nematode genus *Gongylonema*, which—included in their intermediate insect hosts—form the major premise of the "cancer house" argument, Dr. H. A. BAYLIS contributes a critical review, accompanied by tables of measurements of structural details of particular species. Between species there is difference of size, which BAYLIS reasonably thinks may be explained by difference of specific nutritional environment, and there is also difference in the length of the left spicule of the male, which he finds is remarkably variable in individuals from the same specific host. His final, cautiously-expressed conclusion, therefore, appears to be that all the forms hitherto found in different domestic animals (and rats), and *ipso facto* regarded as distinct species, may possibly have to be included in the one original Ruminant species, *G. scutatum.*

iii. Mr. K. G. BLAIR contributes an appendix on the insect intermediate hosts of Gongylonema, magnificently illustrated by TERZI. These include several species of dung-beetles (Scarabaeidae), and of cellar-beetles and meal-worm beetles (Tenebrionidae) and the three common species of cockroaches (Blattidae).

A. A.

JOYEUX (Ch.). **Helminthes et Cancer.**—*Paris Méd.* 1925. Feb. 21. Vol. 15. No. 8. pp. 171–177. [13 refs.]

This is an interesting review, although it does not contain anything novel. In his introduction, the author remarks that although among lower animals instances are frequent of malignant growths starting from inflammatory lesions caused by helminths, our knowledge of similar phenomena in man is deficient in fullness and precision. He then reviews the reactions and lesions of helminthiasis under various general headings. Under new growths of helminth excitation he refers to the epitheliomatous nodules of paragonomiasis and the fibromatous and cancerous growths associated with the various lesions of schistosomiasis; also to FIBIGER'S researches on the development of cancer—capable of metastasis, and inoculable—in rats heavily infected with *Gongylonema neoplasticum,* the intermediate hosts of which are the common cockroaches. He remarks in his conclusion that there are many exciting causes of cancer besides helminths, and that, in civilized countries at least, helminths are among the less common of these causes. He does not doubt that helminths do intervene among the exciting causes, and he attributes even some amount of specific influence to *Cysticercus fasciolaris* and *Gongylonema neoplasticum.* But the nature of this specific influence is not understood; it may be affected by susceptibility of host (specific, varietal, racial, or individual), by predisposition of organ, and by intensity of infestation.

A. A.

LALUNG-BONNAIRE & BABLET (J.). **Premiers résultats de l'enquête sur les tumeurs en Cochinchine.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 495–500. [6 refs.]

This inquest relates exclusively to desperate cases coming to hospital for relief. It includes the years 1922 and 1924, the laboratory of pathological anatomy of the Saigon Institute not having been at work in 1923.

During these two years, 368 cases were investigated, of which 117 were tumours, and of these tumours 84 were malignant.

Of the 84 malignant, 57 (27 in males and 30 in females) are classed as of epithelial origin, and 27 (18 males and 9 females) as of sarcomatous type. Their specific histological characters and their location are tabulated in detail. The author remarks upon the rarity of cancer of the stomach, the frequency of epithelioma of the penis and of cancer of the breast and also (but not to the same extent) of cancer of the cervico-facial region.

The benign tumours, which also are tabulated in detail, suggest nothing remarkable.

The authors conclude, as regards cancer, that the susceptibility of the natives of Cochin-China does not seem to be much different from that of the white races in temperate latitudes.

A. A.

HEYMANN. **L'Institut Curie de l'Indochine.**—*Presse Méd.* 1925. June 27. Vol. 33. No. 51. p. 867. With 1 text fig.

In a country where the incidence of malignant tumours is growing the Curie Institute is to be erected this year by private effort, its objects being the study of the tumours of Indo-China, the organization of measures to combat them, the treatment of patients by modern surgical technique, supplemented by radiotherapeutic methods. There are to be two wards, for the two sexes, of 15 beds each, provided with all radiological appliances. The Institute possesses 437 milligrammes of radium. No details of cost are given, but the façade of the proposed building is impressive.

A. G. B.

BOERMA (N. J. A. F.). **A Few Remarks on the Frequency of Cancer of the Female Genitalia at Batavia.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 172–174.

The author concurs in the opinion that as the general populations of tropical countries come more under treatment in properly equipped hospitals more cases of malignant tumours will come to light. His purpose in this present paper is to draw attention to the fact that cancer of the female genitalia is very frequent with the native population of Batavia. In 2¾ years up to September, 1924, he has encountered 40 cases, the majority under 40 years, of which 21 were natives of Java, 7 half-castes, 6 Chinese, 1 Japanese (and 5 European). Of these cases 38 were carcinoma (30 of uterus, 5 of ovary and peritoneum, 2 of vulva, and 1 of vagina) and 2 sarcoma (1 of uterus, 1 of ovary and peritoneum). The diagnosis was always corrected by the microscope.

A. A.

MACVICAR (Neil). **Notes on Cancer among the Native People. (From the Records of the Victoria Hospital, Lovedale).**—*S. African Med. Rec.* 1925. July 25. Vol. 23. No. 14. pp. 315–316.

Of 10,000 in-patients included in this record, 97 were cases of carcinoma, 30 of sarcoma, and 14 of obscure nature, but probably malignant.

Of the 97 cases of carcinoma, the site in 29 cases was in and about the mouth, in 22 the liver, and in 1 the gall-bladder, in 18 the abdominal alimentary canal, in 6 the skin, in 6 the breast, and in 15 the uterine cervix.

The author attributes the rather frequent cancer of the mouth to mechanical irritation, and that of the liver—which is common in comparatively young men, and occurs even in boys—to schistosome infection. The infrequency of cancer of the breast is attributed to the fact that the native women do not usually wear corsets, and this argument is supported by the concomitant fact that in 2 of the 6 recorded cases the women had worn corsets, and in another case the origin was clearly traced to the pressure of a cord across the breast suspending a garment.

The exact location of the carcinomas, with statistics of age and details of sex, are given in a table.

A. A.

GUAZON (Potenciano C.). **A Study of Cancer Cases in the Philippine General Hospital.**—*Jl. Philippine Islands Med. Assoc.* 1925. June. Vol. 5. No. 6. pp. 157–161. [8 refs.]

Of 7,545 male patients admitted into the Philippine General Hospital in 6¾ years (up to 1921), 150 (1·98 per cent.), and of 3,467 female patients in 4 years (up to 1921), 223 (6·1 per cent.) were cases of cancer. The various sites of the neoplasm are classified in great detail and the age-incidence is classified in decades [but as the former classification is in places confusingly topical, and as native computations of age are notoriously inaccurate, it will be enough to extract some significant figures].

Among the 150 cases of cancer in males 29 affected some of the mouth parts, 19 the cheek, 23 the stomach and pylorus, 18 the penis, and 17 the liver. Among the 223 cases in females, 58 were in the breast, 57 were in the uterus, and 5 in the vagina, 36 in the cheek, 18 in some of the mouth parts, 5 in the stomach and pylorus, and 2 in the liver. The high rate of cancer of the cheek is attributed to the chewing of *buyo*, one ingredient of which is lime.

Only 24·6 per cent. of the male cases and 30·5 per cent. of the female were considered suitable for operation, and of these only 15·3 per cent. of the male and 24·7 of the female are recorded as "recovered," and 22 per cent. of the male and 19·1 per cent. of the female as "improved" in the result.

A. A.

JOUSSET & GIRARD. **Un cas de méningite cérébro-spinale à bacille de Pfeiffer.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 448–450.

Cases of cerebrospinal meningitis in Madagascar are generally due to meningococcus or to pneumococcus.

The patient in this case, a boy of 14 years, was suddenly smitten with a very severe headache, concurrent with bilious vomiting, and quickly followed by fever, delirium, slight rigidity of the neck and very frequent diarrhoea. Nothing could be found in the blood, and nothing but common intestinal worms in the stools ; but the cerebrospinal fluid looked suspicious, and eventually—on the 5th day—was distinctly purulent. The specific treatment up to this had been by antimeningococcus serum. A lucky accident in the course of the cultures from the cerebrospinal fluid revealed Pfeiffer's bacillus, and the patient was then treated, successively, with inoculations of his own haemolysed blood and of an auto-vaccine prepared from an "abscess of fixation." His condition all the while continued extremely grave and on the 12th day, when a right hemiplegia supervened, he was comatose and emaciated. On the 14th day his state began to mend; on the 24th day convalescence was established, and all that remained to be treated was the extensive "abscess of fixation." On the 49th day he was discharged, perfectly sound. Seen 3 months after discharge he was still in perfect health.

A. A.

VAN DEN BRANDEN (F.). **Sur un essai de vaccination anti-méningococcique au Congo belge.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 241–243.

In the period June 4th–August 8th, 1924, at Stanley Pool, there were 23 cases of cerebrospinal meningitis, 13 meningococcal, and 10 pneumococcal. From August 8th all the inhabitants of Leopoldville, some 25,000 souls, received a prophylactic injection prepared with local strains of the A variety. The usual dose for adults was 1 cc., or a milliard of microbes killed by carbolic. There was neither general nor local reaction. From August 24th–September 18th, 13 cases were diagnosed, 3 meningococcal and 10 pneumococcal; 2 of the former had been inoculated, had a slight attack and recovered. From October 1st–December 4th there were 6 cases, 3 of each variety. No conclusion is drawn, and it is pointed out that the number of controls was small.

A. G. B.

NICOLLE (Charles). **Contribution à la connaissance des infections inapparentes (Exemples tirés de l'étude expérimentale du typhus exanthématique.)**—*C.R. Acad. Sci.* 1924. Aug. 18. Vol. 179. No. 7. pp. 375–377.

In his work on typhus since 1911 the author has noticed that some guineapigs out of an inoculated group do not exhibit a trace of fever, but that their blood is virulent for the period during which their fellows are febrile. In the rat this phenomenon is general. To this type of acute infection he has given the name *infection inapparente.** If a rat is inoculated at the same time as a guineapig, and another guineapig is inoculated from the rat on the 2nd or 3rd day of guineapig No. 1's fever, guineapig No. 2 will witness by its rise of temperature to the infection of the rat. More recently he has observed: (1) Besides the rat (grey or white) the white mouse and a gerbille (*Meriones shawi*) contract the inapparent form of typhus; (2) typhus can be transmitted in these rodents in this form in passage (4 passages in the gerbille, 5 in the rat, up to the present); (3) the immunity conferred on the guineapig by experimental typhus of the febrile type is not absolute; of 3 guineapigs reinoculated after suffering from fever a year before none showed fever, but the brain of two was shown to be infective by inoculation to two fresh animals; (4) the immunity conferred on the guineapig by a previous inapparent infection is uncertain and of short duration; some months or even weeks after the inapparent attack they can contract the febrile form; (5) a first inapparent infection vaccinates, at least for some time, the rat, mouse and gerbille against an inapparent reinfection.

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* Hans REITER, who has studied a similar phenomenon in experimental relapsing fever of mice (evidenced by the acquirement of immunity, and not by passage to clean animals), uses the suggestive term dumb infection (*stumme Infektion*). [*Deut. Med. Woch.* 1925. Aug. 21. p. 1400.]

These observations, the author points out, show that the absence of symptoms in an inoculated animal need not prove that it is naturally refractory or has acquired immunity. There are human diseases the study of which does not make progress because no other species reacts to the inoculation of the virus; possibly there are in fact susceptible species, though they do not give evidence of the fact, and, if so, experimental study will become possible. It is logical to suppose that susceptible species which have gone through an infection and are supposed refractory are sometimes able to contract an inapparent infection and to transmit it; some observations on measles appear to point to this.

Finally, it is urged that inapparent infection differs *in toto* from latent infection. Inapparent infection is an acute disease with its incubation, development and recovery, leaving behind it a more or less lasting immunity.

A. G. B.

NICOLLE (Charles). **Contribution à l'étude des infections inapparentes. Le typhus exanthématique inapparent (Premier Mémoire).**—*Arch. Inst. Pasteur de Tunis.* 1925. April. Vol. 14. No. 2. pp. 149–212.

An "inapparent infection" is defined in this memoir as differing from an ordinary infection in being devoid of *clinical* symptoms, and as differing entirely from a latent infection in being an acute septicaemia with its incubation, its evolution, and its recovery, and leaving behind it a more or less durable immunity. It is also defined as an infection reduced to the very lowest degree of virulence—and as representing the last stage before resistance.

Inapparent typhus—the inapparent infection here considered—was first disclosed to the author and LEBAILLY in the guineapig. In guineapigs inoculated with typhus virus the usual and the only symptom is fever of varying severity and duration. Sometimes, however, the temperature of the inoculated animal remains perfectly normal; and yet its blood becomes virulent, since when inoculated into another guineapig at the proper time—the proper time being during the period when in a normal case the temperature would have risen—it produces the usual febrile symptom in that guineapig. Experimental typhus in guineapigs, then, is here revealed as a septicaemia of which the sole clinical manifestation graduates from an extreme of well-characterized fever to an extreme of zero, this last extreme being "inapparent typhus."

The causation of inapparent typhus is to be sought in insufficiency of the number of germs inoculated; its meaning is interpreted as a resting-stage in the recovery of virulence. [It may be mentioned that Alexander OGSTON, of Aberdeen, taught, as long ago as 1882, although his experiments seem to have remained unpublished, that the severity of a septicaemic infection, *e.g.*, acute suppurative osteomyelitis, was governed by the amount of the dose of germs inoculated.]

In the rat, as also in the mouse and in a common gerbille of Tunis, inapparent typhus is still more definitely integrated. In the rat experimental typhus is always inapparent (" the first example known of an infection, a septicaemia, strictly asymptomatic "), since it remains inapparent in its passage from rat to rat, and can be made manifest to the observer only by inoculation into a guineapig. [Here, then, the conception of an inapparent infection appears in its full significance as an infection reduced almost to a geometrical " point " of abstract virulence.]

The author infers from his experiments that in guineapigs and the other rodents above specified, inapparent typhus leaves behind it a certain degree of immunity to febrile typhus (guineapig) and to non-febrile or inapparent typhus (guineapig and the other rodents), although preventive properties have not yet been found in the serum of rats recovered from inapparent typhus. This acquired immunity is lost in 4 to 8 months.

He discusses the possibility of the occurrence of inapparent typhus in man and methods of scrutinizing its existence, and the possibility of the existence of inapparent forms of other infections, particularly whooping-cough and measles; and he shows how such inapparent infections would explain the preservation of viruses in Nature and would assist in elucidating the occurrence and revival of epidemics. He also suggests the possibility of some human diseases attacking domestic animals in the form of inapparent infections, and *vice versa.* Finally, from this study of inapparent typhus, he leads us beyond the present pathological canon, to surmises of an unknown world of infinitesimally benign infections—an unsuspected pathological underworld of hardly imaginable promise to the explorer.

A. A.

i. NICOLLE (Charles) & LEBAILLY (Charles). **Recherches sur la filtrabilité du virus exanthématique. Une application instructive de la connaissance des infections inapparentes.**—*Arch. Inst. Pasteur de Tunis.* 1925. Apr. Vol. 14. No. 2. pp. 213–221. With 5 charts in text.

—— & BLANC (Georges). **Deux expériences anciennes et inédites sur la filtrabilité du virus exanthématique.**—*Ibid.* pp. 222–223.

i. Publication of the experiments detailed in this paper has been withheld for six years. The most interesting is that of guineapig 78 inoculated with filtrate from an emulsion of the suprarenal capsules of a guineapig at the third day of its fever. The animal had no rise of temperature during a period of 42 days, but two animals inoculated from it on the 12th day both had fever and subsequent immunity. Guineapig 78 suffered, therefore, from inapparent typhus. This experiment and others show that the typhus virus can traverse Chamberland L2 filter, and the occurrence of inapparent typhus suggests that filtrates may be infective more often than is suspected. The authors regard the agent of typhus as at the limits of filtrability. If a sufficient number of germs get through typhus fever is produced; a smaller number may give rise to the inapparent form. Moreover, negative results in these investigations are worthless unless the possibility of inapparent typhus has been considered; so that doubt is cast upon many of the " negatives " of the past.

A. G. B.

MILES (Lee Monroe) & FENG (Chih-Tung). **Calcium and Phosphorus Metabolism in Osteomalacia.**—*Jl. Experim. Med.* 1925. Jan. 1. Vol. 41. No. 1. pp. 137–157. [26 refs.]

Osteomalacia is prevalent throughout the northern and western parts of China, the incidence in some districts being very heavy—from 1 to 5 per cent., or, according to Chinese statements, even 10 per cent. of the adult females of the locality. The diet of the masses appears to be very poor; it consists chiefly of millet-gruel seasoned with onion, garlic, etc., turnip or radish preserved in brine, and a sort of sauerkraut made of leaves of bean plants, and those who can afford it eat also some wheat-flour cakes, " bean curd " and " celery cabbage," but no meat or milk or eggs.

Experiments conducted by the authors lead them to the conclusion that osteomalacia is a deficiency disease of the same category as rickets, the deficiency being principally in the fat-soluble vitamin content of the diet, though there may be a concurrent calcium deficiency. The experiments also give suggestive results as to treatment and prevention of the disease.

Ten women (of whom one disappeared prematurely) were kept for a week on a diet approximating to the vernacular. At the end of the term the calcium content of the serum was found usually to be less than half that generally considered to be normal, and the phosphorus content showed in some a marked deficiency, but in others came within normal limits. The 9 women thus dieted were then put under different treatments for 12 days, and the results of the treatments observed clinically and analytically. Those who received 30 cc. of cod-liver oil daily either with or without 2 gm. of calcium lactate all showed a net gain in blood calcium and felt much better. Those who received calcium salts alone showed in some cases an increase in blood calcium, and one who had calcium phosphate alone was clinically worse. Two whose treatment consisted merely of a liberal diet with milk and eggs and plenty of fresh vegetables showed, by contrast, a decrease in blood calcium and were clinically much worse. The benefit of cod-liver oil was thus demonstrated.

Finally, four selected women (three with a definite history of the onset of the disease during first pregnancy or the puerperium, and one who had never been pregnant) were kept for 7 days on something slightly better than the vernacular diet, since it included preparations of wheat flour and green soy bean, and then for 12 days (on the same diet) under different experimental treatments, their calcium and phosphorus balance being compared before, during, and after the treatment. No. 1, who received 8 cc. of cod-liver oil thrice a day, showed a calcium balance changed from negative to positive, a rise of blood calcium from 7·503 to 8·62 mgm. per 100 cc. of serum, and a slight change in phosphorus balance only. In No. 2, who received the same amount of cod-liver oil along with 1 gm. of calcium lactate daily, the calcium balance and blood calcium showed an even higher rise, the phosphorus balance was even more strongly positive, and the blood phosphorus rose from 1·24 to 2·10 mgm. per 100 cc. of serum. In No. 3, who received the same amount of cod-liver oil along with 1 gm. of calcium phosphate daily, all the above-specified changes for the better were still more strongly marked. No. 4, who received olive oil instead of cod-liver oil, along with 1 gm. of calcium lactate, alone remained unimproved clinically; her calcium balance remained negative, though the blood calcium increased almost in proportion to the others, and the blood phosphorus remained practically stationary with a small change in the balance.

A. A.

MAXWELL (J. Preston) & MILES (Lee M.). **Osteomalacia in China.**—*Proc. Roy. Soc. Med.* (Sect. of Obstetrics & Gynaecology.) 1925. June. Vol. 18. No. 8. pp. 48–65. [25 refs.]

The conclusions of this interesting paper are as follows:—

"(1) China is at present one of the world-centres for the study of osteomalacia.

"(2) In the special area involved the incidence is from 1 to 3 per cent. of child-bearing women.

"(3) While its effects are more often shown in pregnancy and the puerperium, it often begins about the time of puberty.

"(4) The disease is one due to a deficiency diet, the principal lack being in a shortage of mineral content and the activator for calcium metabolism.

"(5) Lack of sunlight and movement are contributing factors in its production.

"(6) The bones of full-term foetuses from mothers with osteomalacia do not show the signs of rickets, but of osteoporosis. There is, however, a little evidence to suggest that these infants develop rickets more easily than the normal child.

"(7) The sequelae of the disease are twofold—firstly, deformity of the pelvis, which may be counteracted by a planned Caesarean section; secondly, interference with marital relations, which may be treated by a new operation in which portions of the pubes and ischium are resected.

"(8) The ovaries have nothing to do with the disease, and it is not necessary either to remove them or even to tie the tubes, provided that the woman is treated with cod-liver oil and calcium, and this treatment is kept up during any future pregnancy.

"(9) By improving the diet and supplying cod-liver oil it should be possible in due time to stamp out the disease. Prevention is the principal thing, and to this end a settled government and improved means of communication are essential."

With regard to etiology they conclude:—

"(1) Osteomalacia is a diet-deficiency disease and is to be placed in the same category as rickets.

"(2) The deficiency is principally in the fat-soluble vitamin or calcium-activator content of the diet, though there may be and probably is an actual or at least a proportional calcium deficiency at the same time.

"(3) The result of this deficiency diet is that a disturbance of the normal calcium metabolism is set up, and it is possible that in addition to the diet deficiency there arises a toxic process through the agency of an unbalanced protein consumption (cereal).

"(4) Intercurrent septic infections will aid in the progress of the disease, but probably only by lowering the general vitality, and there is no evidence of such infection in the majority of cases.

"(5) The evidence suggesting diseased processes in the ovaries and parathyroid is insufficient to place the blame for the disease on either organ.

"(6) Osteomalacia may be prevented by improving the diet of the population in the direction of a fuller supply of fat-soluble vitamin and salts. It may be cured by providing a sufficiency of food plus a calcium activator such as cod-liver oil and sunlight."

[It is worth noting that osteomalacia is extremely rare in the male. The authors had only one case, in a boy of 12. The etiology must take account of this.]

A. G. B.

STAPLETON (Grace). **Late Rickets and Osteomalacia in Delhi. An Analysis of Seventy-Three Cases.**—*Lancet.* 1925. May 30. pp. 1119–1123. With 3 text figs. [1 ref.]

These cases were seen at the Lady Hardinge Hospital, Delhi, during the years 1921–24.

" Late rickets was diagnosed when there was a clear history that the patient had been quite well and free from all deformity of the legs or other bones until at least eight years old, and marked enlargement of the lower ends of the radius and ulna about the epiphyseal junction was present, while on X-ray examination, where it is possible to obtain it, signs of active disease with defective ossification and cupping of the end of the diaphysis were shown . . ."

" Osteomalacia was diagnosed when there were symptoms of pain in the lumbo-sacral region of the spine and thighs, often spreading to other parts of the body, difficulty in rising and walking, with the typical cautious, waddling gait, accompanied by tenderness in the bones."

The cases were found to form a series from the typical late rickets in girls of 10–14, through a stage in rather older patients who still showed the X-ray signs of bony rickets and had the deep-seated pains of osteomalacia as well, to the well-developed forms of osteomalacia. Of the 73 cases 20 could be definitely diagnosed as late rickets, all showing enlarged wrist epiphyses ; their ages were 10–20 and 16 were between 12 and 17 years. Six cases (ages 16–20) had signs of both diseases, the chief of which are noted. The cases of true osteomalacia numbered 47 ; these again were older, but some of the younger of them still showed signs of late rickets—prominent wrists, rib beading, bowed legs.

A study of the place of origin of the " disease " showed it to be prevalent among girls used to unrestricted village life in childhood and then brought into crowded urban quarters. [When the author writes of " the disease " one concludes that she regards the two conditions as really one.] The Hindus in this series numbered 55 and the Mohammedans 15 [the author speaks of the different incidence in these communities, but does not give us the figures of their respective attendances at the hospital]. Most of the Hindus were Banyas, and many of these were well-to-do ; the Mohammedans were usually poor. Some details are given of the diet, and it is concluded that " the better vegetarian diet containing animal fat in considerable quantity " is not sufficient in itself to prevent the development of the disease. The home conditions are discussed, but it is realized that to get any precise data the buildings must be seen. A careful consideration of the relation to purdah life shows that in 63 cases, or 86 per cent. of the whole, the " disease " was closely associated with purdah life. The age of onset of symptoms is of such interest that the table is reproduced.

Age.	Late rickets.	Osteo. and int.†	Age.	Late rickets.	Osteo. and int.†	Age.	Late rickets.	Osteo. and int.†
8–10	5	—	16	—	9	25	—	2
10	—	1	17	—	4	27	—	2
11	1	1	18	—	5	29	—	1
12	1	—	19	—	6	30	—	1
13	6	2	20	—	4	44	—	1
14	1	5	21	—	3	60	—	1
E.C.R.14*	1	—	22	—	1			
15	5	3	23	—	1	Total	20	53

* E.C.R.14=Early childhood and recrudescence at 14

† Osteo. and int.=Osteomalacia and intermediate cases.

Details are given of the two oldest cases. Other tables show that in 16 instances the onset preceded puberty and in 2 followed the menopause; that in 30 cases it preceded the first pregnancy and in 2 was many years after the last. The 30 cases included the 20 of late rickets, leaving 10 cases of osteomalacia developing before pregnancy; moreover, 14 cases occurred during the first pregnancy, which goes against the "exhaustion" hypothesis.

Among special symptoms and signs the author notes tetany and spontaneous fractures. Tetany occurred in 30 out of 63 cases in which a record was made, and out of 29 cases in which an X-ray photograph of forearms or knees was obtained signs of spontaneous fractures were found in 14. The conclusions are as follows:—

"1. There is no sharp dividing line clinically between late rickets and osteomalacia cases, but intermediate cases are found showing characteristics of both. The difference in symptoms appears to be due to conditions of the tissues depending on the age of the patient.

"2. The determining cause in the majority of cases is the lack of sunlight and exercise associated with the purdah life in North India.

"3. The disease usually commences about puberty or in early adult life, but cases do occur occasionally in older women even past the menopause.

"4. Osteomalacia is not uncommon in young women apart from pregnancy.

"5. Tetany frequently occurs in the course of osteomalacia, and this suggests some close relationship between the metabolic disturbances that give rise to the two sets of symptoms."

A. G. B.

Sɪsᴏɴ (A. G.), Sɪsᴏɴ (A. B. M.) & ᴅᴇ Lᴇᴏɴ (W.). **Hepatic Cirrhosis in the Philippines.**—*Jl. Philippine Islands Med. Assoc.* 1925. Feb. Vol. 5. No. 2. pp. 37–40. [3 refs.]

The authors have made a study of all cases of cirrhosis of the liver admitted to the Philippine General Hospital from 1913 to 1924 (169) and of the cases which came to autopsy in the same period (152 in 9,000 autopsies).

"Pathologically, the incidence of the different types of cirrhosis is as follows:—

Portal	71 or 0·7 per cent.
Biliary obstructive	23 or 0·25 per cent.
Biliary hypertrophic ...	2
Syphilitic	1
Unclassified	55 or 0·61 per cent.
Total	152 or 1·68 per cent."

The unclassified were mostly light cases.

Cirrhosis occurs at any age with a gradual increase from the second to the fourth decade; it is thrice as frequent in males as in females. An attempt is made to gauge the influence of alcohol, malaria and dysentery [but we are not told the frequency of such history in non-cirrhotic cases]. Cirrhosis is less common in the Philippines than in countries where alcohol is more commonly and more heavily used. The chief difference, however, between the Philippines and America or Europe is in the frequency of portal cirrhosis in young persons; the highest incidence is between 21 and 30, whereas elsewhere it falls much later, and diseases of the gall-bladder and bile ducts and primary carcinoma of the liver affect the Filipinos early also. The authors incline to attribute this to use of spices—black pepper and capsicum—and to the frequent incidence of malaria and typhoid.

A. G. B.

LICHTENSTEIN (A.). **The Importance of the Quantitative Urobilin-Test for the Diagnosis of Cirrhosis Hepatis.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 136–147. [13 refs.]

The author criticizes various methods of determining the amount of urobilin in urine and faeces and states his preference for one described by TERWEN. He gives abstracts of four cases of hepatic cirrhosis, with details of this subject. In only one of them was the total amount of urobilin greatly excessive, but what was remarkable was the large amount excreted in the urine as compared with the faeces. In normal urines the largest daily amount detected by the author has been 1 mgm.; in these four cases the daily average was, individually, 12, 38, 35, and 4·5 mgm. The author shows that in 2 cases of haemolytic jaundice and 8 cases of pernicious anaemia investigated by him the amount of urobilin excreted in the urine, though considerably in excess of normal, did not attain these high figures.

A. A.

SARRAMON & PONS (R.). **Tumeur mycosique de la face interne de la joue chez un Annamite.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1924. Apr. Vol 2. No. 4. pp. 96–97.

The patient was aged 84. The tumour, of the size of a five-franc piece, resembled a great condyloma. It was ulcerated, of woody hardness and creaked under the knife It was constituted of stratified epithelium with a very close woof of mycelium. In cultivation it was found to be a Monilia resembling *M parakrusei* but not, like it, clotting milk. Under pot. iod. treatment the tumour rapidly diminished.

A. G. B.

CASTRILLON (Basolio A) & BORSANI (Ernesto P.). **Micosis aspergilar.**—*Semana Méd.* 1925. Apr. 23. Vol. 32. No 17. pp. 924–926.

An Argentine woman, 50 years of age, came under the authors' care with signs suggestive of pulmonary tuberculosis. There was, however, no fever and no acid-fast bacilli could be found. Expectoration was profuse, 150–500 cc. in 24 hours, dark yellow in colour. X-rays showed no abscess or affection of the liver. Examination of the sputum revealed hyphae and cultivation yielded a growth of *Aspergillus fumigatus*. Rapid improvement ensued on administration of potassium iodide, 2, 3, and 4 gm. on successive days, and the last dose maintained for a week. The patient left hospital in a fortnight.

H. Harold Scott.

ANDERSON (Ch.). **Sur un cas d'otomycose à** *Sterigmatocystis nigra.*—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 93–96. With 1 plate. [2 refs.]

Cultures of *Sterigmatocystis nigra* from a lady's ear, non-pathogenic at first to rabbits, became so after numerous passages on media more and more alkaline. The mould was recovered from the rabbit's lesions. The author has repeated the experiment, but without success.

A. G. B.

DELANOË (L.). **Sur un cas de maladie d'aïnhum ayant intéressé la jambe droite.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 470–474. With 1 text fig. [1 ref.]

This paper contains a long account of suppurating sores and fistulae of both elbows and of the right knee and foot, and a figure of the last, showing a swollen knee, a deformed and emaciated shank and a greatly swollen foot of most insalubrious aspect. GOUZIEN criticizes it as an interesting case, but not ainhum.

A. A.

YOUNG (W. A.). **An Aneurism and a Gumma in the same Heart.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. pp. 87–88. With 2 figs. on 1 plate. [1 ref.]

In this case, from Accra, an African youth of 24, still at school and regarded as healthy though not very strong, suddenly expired at night. His heart, which was found to be much enlarged and to weigh 20½ oz., had the left ventricular wall occupied by an aneurism and a gumma. The liver also was studded with small gummata.

The author refers to three cases of endarteritis reported from Accra by MACFIE and INGRAM [this *Bulletin*, Vol. 17, p. 422] where the patients were boys, in one of whom, though only 6 years old, gumma-like tissue suggestive of a syphilitic causation was found.

As instances of Africa precocity in venereal encounters the author cites the case of a boy of 10 years treated by PATERSON at the Gold Coast Hospital for Hunterian chancre, and a case of his own in Freetown of a boy of 10 years suffering from gonorrhoea and hard chancre. In Dr. PATERSON'S case the patient spontaneously stated that the accident was the result of adulterous iniquity.

A. A.

JAMIN (H.). **Stomatite d'automne.**—*Arch. Inst. Pasteur de Tunis.* 1925. Jan. Vol. 14. No. 1. pp. 126–129.

The author has seen this "autumn stomatitis" for some years in Tunis. The patients complain of a sensation of heat and tingling in the buccal mucosa. The chief lesion is on the tongue and consists of a bright red area denuded of papillae with well-defined somewhat pinked edges; in light cases it travels slowly from the centre to the edges, where all becomes normal. Similar lesions are usually seen on the gums, lips, cheeks and soft palate. The cause is obscure. The treatment consists of a wash of borax and balsam of Peru.

A. G. B.

NOGUE (M.). **Epidémie de glossite observée au Sénégal.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 501–507. With 4 figs. on 1 plate. [1 ref.]

The author describes an epidemic of glossitis among natives, chiefly children, at Dakar, in December, and refers to JAMIN'S paper (see above). There is a characteristic denudation of the tongue generally affecting the anterior third which may be associated with lesions on the inner surfaces of the lips and cheeks and more frequently with excoriation at the commissures of the lips, giving a macerated appearance. There was no enlargement of lymphatic glands and the general condition was good. In some outbreaks, however, gastro-intestinal troubles were present, and it was noted sometimes that both cleared up at the same time with improved feeding. The only symptom complained of was a burning sensation on eating. Some of Nogue's associates have incriminated peppermint and salt fish as causes, but he notes the seasonal incidence and suggests that the condition is the result of some infection.

Chlorate of potash and boroglyceride have been found useful. Nogue states that with the exception of JAMIN's paper he has seen no reference to a similar condition.

[The glossitis associated with the lesions at the commissures of the lips reminds the reviewer exactly of the condition he observed among natives of Nyasaland, and which he showed to be symptoms of pellagra. The sodden condition of the mucocutaneous surfaces at the angles of the mouth (and at the angles of the palpebral fissures and the free margin of the prepuce) were then for the first time described in the symptomatology of pellagra and it was pointed out that these might precede by a year or more the rash and other signs of that disease (*Trans. Soc. Trop. Med. & Hyg.*, Vol. 5, No. 3, and Vol. 7, No. 1). Nogue does not even mention pellagra in discussing diagnosis, but it would be interesting to have a careful watch kept for other manifestations of that disease which may be missed in a black-skinned race by those only familiar with descriptions of the disease in Europeans.]

H. S. Stannus.

MATHIS (C.) & GUILLET. **Sur la nature de l'épidémie de glossites observés au Sénégal.**—*Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 586–590. With 6 text figs.

During the months February–April, 1925, the authors had the opportunity of observing among school children at Dakar numerous cases of the epidemic glossitis described by NOGUE (see above). The chief feature of the affection according to NOGUE was a characteristic denudation of the tongue, commonly limited to the anterior third with associated lesions on the inner surfaces of the lips and cheeks and excoriations at the angles of the mouth, accompanied by gastro-intestinal disturbance, whereas the present writers describe the lesions on the tongue as a creamy coating affecting the posterior two-thirds of its surface, the anterior third and sometimes the middle being the seat of pearlylike patches, with or without fissuring and hypertrophied papillae, and make no mention of other symptoms. Fixing their attention on the furring of the tongue which recalled somewhat thrush, they made a number of attempts to isolate a causative organism. Examinations of smears were negative for mycotic elements, but showed constantly the presence of what is believed to be a bacillus having a length up to 25μ. Attempts at culture failed, and subcutaneous inoculation into mice and guineapigs produced no local or general reactions. In 8 out of 10 children examined the Wassermann reaction was negative, the two positive results being accounted for by hereditary syphilis. [It would appear possible, judging by NOGUE's account, that the lesions upon which the authors lay stress, together with the organism described by them, are but secondary features.]

H. S. Stannus.

ROGERS (Leonard). **Relationship between Pneumonia Incidence and Climate in India.**—*Lancet.* 1925. June 6. pp. 1173–1177. With 5 text figs. [6 refs.]

It has long been known that lobar [illegible]ia is particularly prevalent in the arid north-western pa[illegible]a, and this fact is confirmed by the jail statistics for 15 yea[illegible]–1910), upon which this paper is based. (The jails are in charge of I.M.S. officers, and provide trustworthy data.)

In this Indian jail-population the total annual rate of pneumonia-incidence being 13·3 per mille, that for the dry north-western tracts ranged from 50 (Lower Indus valley) to 22 (W. sub-Himalayan region), while that for tracts of high humidity ranged from 4·2 (Burma coast) to 13·4 (Bengal and Orissa). This vastly higher pneumonia-incidence in the arid north-western parts, however, was restricted to the cold season (November-February) ; in the hot season and rains the percentages of cases were there the lowest in India. The cause of the excessive prevalence of the disease in the north-western parts must, therefore, be sought in the climate-conditions of the cold season.

As compared with other parts of India the cold-season climate of the north-west shows (*a*) the lowest atmospheric humidity, (*b*) the lowest minimum temperatures, and (*c*) the extremest daily ranges of temperature ; there is also (as over most of northern India) a prevalence of northerly winds. These are the conditions that conduce to " chill," particularly among a scantily-clad people—great diurnal variations of temperature, with a low minimum.

It is known that the types of pneumococcus prevalent in India are a normal element of the pharyngeal flora, and also that the onset of pneumonia is commonly attributed to a chill.

A. A.

PERDOMO HURTADO (B.). **Epidemia de escarlatina en Caracas.**—*Bol. Hospitales.* Caracas. 1925. Feb. 15. 2a Epoca. No. 3. pp. 173–176.

Scarlatina has been present in Caracas for many years, some 30 at least. During this time there have been, according to the author's investigations, about 450 cases, nearly all in children, mostly between the ages of 6 and 12 years. The vast majority were mild, though some were severe with renal symptoms, and a few have terminated fatally. Brief remarks are made on the question of diagnosis and possibly some of the cases may not have been true scarlatina, since among them are included patients who suffered from sore throat and rise of temperature without any eruption. [See also RISQUEZ, p. 946.]

H. Harold Scott.

CHŌSA (N.). **Experimental Study on the Goitre found in Certain Districts of Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1925. Apr. No. 241. English summary pp. 2–3. [In Japanese.]

In a district of Shinchiku Province, Formosa, the percentage of goitre is 44·3. Experiments were made with the drinking water (from springs) ; 77 rats were used, divided into four groups. The first and second groups received the unboiled water, the first on the spot, the second at Taihoku where there is no goitre. The third group received the same water boiled, the fourth Taihoku water. Rats of the first two groups became goitrous, those of the second two remained free. The first changes were noticed after three months. Some of the follicles showed partial atrophy with cloudy swelling of the epithelial cells; others remained healthy, but became dilated and filled with colloidal matter.

A. G. B.

ANDERSON (L. A. P.), HOWARD (Albert) & SIMONSEN (J. L.). **Studies on Lathyrism. I.** -*Indian Jl. Med. Res.* 1925. Apr. Vol. 12. No. 4. pp. 613-643. With 1 text fig., 13 figs. on 2 plates. [33 refs.]

The authors here show, after three years' work, that, contrary to the conclusions of ACTON (this *Bulletin*, Vol. 20, pp. 46 & 645), the poisonous seed which produces lathyrism is not *Lathyrus sativus* or *khesari*, but that of a leguminous weed which grows with it, *Vicia sativa*, var. *angustifolia*, known to the natives as *akta*. The varying conclusions of previous observers are explained by the fact that the crop is rarely grown in pure culture, and the sample of seed obtained is mixed; the authors obtained a pure culture and were able to experiment with the seeds of five leguminous plants. They write :—

"The results of the chemical investigation and of the feeding trials with *khesari* are in complete agreement. A number of samples of seed of different ages, from localities where lathyrism does and does not occur and drawn from produce stored in a variety of ways, were tested for bases. In no case was even a trace of alkaloid found. The results were entirely negative, and from the chemical standpoint the seeds of *khesari* appeared to be harmless. These results received striking confirmation when pure *khesari* was fed to ducks and monkeys. No sign of any deleterious effect resulted from the use of this grain as food for these animals. The grain has been given in very large proportion of the whole dietary—in the case of ducks from 50 to 100 per cent. and in monkeys from 70 to 100 per cent.—the balance where necessary being made up with normal foodstuffs. The animals all appeared to thrive on these diets over long periods, and their condition has shown no appreciable difference from that of the control animals . . . So far as our experiments go, it would appear that pure *khesari* is a harmless and satisfactory food for both ducks and monkeys.

"The investigation of the weeds met with in *khesari* have yielded results very different from those obtained with the main crop. When the seeds of one of these weeds—a vetch known as *akta* (*Vicia sativa* L. var. *angustifolia*)—were examined chemically, bases possessing alkaloidal properties were at once detected, isolated and their chemical constitution determined. One of these—divicine, which exists in the seeds combined with a sugar as the glucoside vicine—was found, by inoculation experiments with guineapigs, to possess distinct toxic properties. When the seeds of *akta* were fed to ducks and monkeys, definite symptoms were observed after a comparatively short time. So far as ducks are concerned, we have no doubt that the symptoms observed were due to feeding with *akta*. The certainty with which a fatal disease could be produced, and the fact that this disease only occurred when *akta* was one of the constituents of the diet, afford very strong evidence in favour of this. We have shown that actual starvation could not have been the cause of death, and avitaminosis could not, in our opinion, be held responsible. There remains, therefore, only one other possibility, namely that *akta* is poisonous to these animals. So far as monkeys are concerned, the evidence is also very strongly in favour of this hypothesis . . . The majority of the animals have shown a definite syndrome which is characteristic and was identical in every case . . . In seven out of the nine animals fed on *akta* these definite pathological signs have been observed. *Akta* was the only test grain universally present in the diet of all these seven, while *khesari*, though also present in two of the diets, was absent from the othei five.

* * * * * *

"The prevention of the disease, if it should prove to be due to contaminating weeds, appears to be a more simple matter. The growth of *khesari* in lines about a foot apart, combined with very careful weeding in the early stages, would result in a pure culture of this crop and grain free from *akta* and other weeds. All our results indicate very clearly that no harmful result will follow the consumption of pure *khesari*."

They are not yet in a position to state, in the absence of pathological proof, that *akta* is the cause of lathyrism in man.

A. G. B.

MELENEY (H. E.). **Schistosomiase et kala-azar en Chine.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 364–368. [10 refs.]

Schistosomiasis in China is found chiefly in the Yangste valley, where rice is cultivated and lakes and canals are numerous, its presence depending on that of the intermediary mollusc host. It is unknown in the north. Kala azar, on the other hand, is found only in the dry regions to the north, where abundant rain never falls except in July and August. The endemic areas do not trench on one another. The diseases have three features in common.—In both there is moderate enlargement of the liver and great distention of the spleen. In both the blood globulins are increased, as evidenced by the distilled water precipitation test or the formol-gel test. Both are more favourably influenced by antimony than by any other drug.

FAUST and Meleney have shown that the young schistosoma migrates in the mammalian host entirely by the blood channels; after the worm become localized in the lungs innumerable little haemorrhagic foci form in all the organs but the liver; they are found equally in the lesions of the kidneys and in those of the gastric mucosa; the young parasites in the liver are always found in the branches of the portal vein. While a considerable number of worms is found in the pleural cavity, there are very few in the peritoneal. In dogs killed when the egg-laying period has begun the eggs are found chiefly in the mucosa close to the lumen of the intestine; there is no haemorrhage, which shows they are inside the capillaries. Often 200 are grouped together, some completely developed, others immature; evidently most of the eggs are expelled from the uterus at once.

The discovery by SMYLY and YOUNG of the hamster as a suitable experimental animal for kala azar is described. Parasites are found in the spleen and liver a few days after inoculation. The histological lesions have been followed in these animals till 15 months after infection. The macrophages or endothelial leucocytes are the only cells affected. These increase in number, replacing the normal tissue of the affected organs, and at the end the multiplied parasites are found engulfed in them. In the liver it is the Kupfer cells which proliferate in this manner.

A. G. B.

TAI (J. T.). **A Glimpse into the Question of Splenomegaly.**—*Nat. Med. Jl. China.* 1925. Apr. Vol. 11. No. 2. pp. 75–84.

In Yangchow Baptist Hospital (Kiangsu) the author has, in the last four years, studied 46 male cases of splenomegaly. The average age was 30 years, the average duration of splenic enlargement 8, and of ascites 1 year. The most prominent symptoms were anaemia, 67 per cent., and ascites, 56 per cent.; in 12 of the cases the spleen reached the umbilicus. Liver enlargement was frequent. In 52 per cent. there was a history of chills and fever and in 24 per cent. *Schistosoma japonicum* ova were found; around Yangchow the usual percentage of these ova in faeces is 7. Kala azar is rare in this part of China, and in 3 splenic punctures Leishmania were not detected. The average of a few blood counts showed leucocytes 5,470, r.b.c. 3,610,000 and haemoglobin 62 per cent. The spleen was removed in one case; palliative treatment was usually employed. Four patients died in hospital. The author thinks that splenectomy should be performed more often in early cases. He calls for intensive study of Chinese splenomegaly. [It does not appear that the removed spleen was examined histologically.]

A. G. B.

REMLINGER (P.). **Sur la fréquence de l'asthme à Tanger.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 421–430. [5 refs.]

A long paper from which little can be learned but that asthma is common at Tangiers, much more so than in other Moroccan towns, and is becoming commoner. Figures are given of 60 dispensary patients, and from these and other data the author finds that a neuro-arthritic diathesis is frequent (diabetes, obesity, eczema, migraine, colic, etc.). The most usual age is between 20 and 50, and men are affected more often than women. It occurs at all times of year, but more especially at the beginning of spring and end of summer, which is in favour of pollen causation. Most of the patients are Jews in easy circumstances. Though not dangerous, asthma in Tangiers is recalcitrant to treatment and relapses readily. Among causes other than the neuro-arthritic diathesis the author names irritability of the nervous system, the result of the trying sea climate, the violence of the winds, and perhaps the high humidity and dust, as well as syphilis and tuberculosis, but he admits that there are unknown factors.

A. G. B.

ROBERT (Vital). **Cas déclarés de tétanos guéris par la sérothérapie.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 435–436.

Two native soldiers with well-developed tetanus were treated with serum, in one case 220 cc. in 5 days (130 intravenously, 10 intraspinally), in the other 120 cc. in 3 days (100 intravenously, 20 intraspinally): a chigger ulcer of the big toe was the point of infection in one case. Both recovered. The author thinks that not less than 60 cc. must be given daily, with local treatment and chloral. AFFRE stated that at the Maternity Clinic at Dakar he had treated 30 cases of tetanus of the new-born without a single recovery, though some babies received as much as 120 cc. of serum. The injections were usually given under the skin or into the muscles.

A. G. B.

NOGUE (M.). **Un cas de noma très amélioré par le stovarsol.**—*Bull. Soc. Path. Exot.* 1925. May 13. Vol. 18. No. 5. pp. 433–434. With 1 text fig.

Two cases seen at Dakar are in fact described.

(1) Phagedenic ulcer in a child of a month's duration, 4 cm. in diameter and exposing the tendon of Achilles; dressed daily for 20 days with stovarsol powder; rapid improvement. (2) A case of noma in a child of two years. A gangrenous ulcer of the cheek of 5 cm. diameter; necrosed maxilla seen at the base. The dead tissues were scraped or cut away, stovarsol powder in a small quantity of water was applied night and morning, and 150 gm. physiological serum injected daily under the skin. Again improvement was rapid.*

Comparable results were obtained with treparsol and novarsenobenzol. Their use can be alternated with that of Vincent's powder and salicylic acid solution. Stovarsol and treparsol should be supplied by the trade in powder as well as in tablets.

A. G. B.

LE CHUITON (F.). **Essai de vaccinothérapie dans les adénites tropicales.**—*Arch. Méd. et Pharm. Nav.* 1925. Apr.–May–June. Vol. 115. No. 2. pp. 154–163. [1 ref.]

Six cases of "tropical adenitis" were treated at Saigon by vaccines, which, however, in the author's opinion, do not have a specific action, but rather play the part of antigens to the microbes which are secondarily associated with the true agents. Two of the cases are briefly abstracted here:—

A sailor entered hospital on September 25th with the glands of the right groin swollen to the size of a hen's egg, hard but softened in parts; remittent fever. October 2nd, incision gave exit to sero-grumous pus in which Gram-positive cocci were seen; a white staphylococcus was grown. On October 17th a stock antistaphylococcus vaccine was injected and again the next and succeeding days. On November 2nd the patient was discharged cured. Another was admitted on January 9th with similar signs. On January 13th the swelling was explored by syringe and Friedlander's pneumobacillus was grown. Antistaphylococcus vaccine was then injected and on January 23rd he rejoined his ship. He returned on February 3rd with the swelling as at first, an autovaccine was made, and cure and discharge followed on February 25th.

A. G. B.

VIRGILLO (Francesco). **Nota sulla riproduzione sperimentale del linfogranuloma inguinale subacuto.**—*Ann. di Med. Nav. e Colon.* 1925. May–June. Year 31. Vol. 1. No. 5–6. pp. 268–271. With 2 figs. on 1 plate. [3 refs.]

The author withdrew some purulent fluid from the interior of an inguinal gland of a patient with subacute lymphogranuloma and injected it subcutaneously in the inguinal region of two guineapigs. One of these died a month later with a nodule the size of a millet seed, and on excising this and examining it microscopically he found it to be a swollen gland with a central focus of coagulation-necrosis and showing the intracellular bodies described by GAMNIA and FAVRE.

H. Harold Scott.

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* The author, in a later note (*Bull. Soc. Path. Exot.*, June, p. 501) informs us that after a three-day interval in which the child was not brought for treatment the disease had again progressed and the issue was fatal.

RIVAS MAZA (F. de P.). **Observaciones de pseudo-paludismo y pseudo-tuberculosis.**—*Rev. Med. y Cirug.* Caracas. 1925. Feb. 28. Year 8. Month 4. No. 83. pp. 69–79.

Four cases are recorded with obstinate daily rise of temperature and loss of weight, symptoms diagnosed as due to malaria and, later, tuberculosis. Three proved to be syphilitic and cleared up on specific treatment, the fourth, who had troublesome diarrhoea, was treated by injections prepared from Monilia in the stools and recovered, the condition being regarded as sprue.

H. Harold Scott.

SPENCER (H. A.). **Lightning Stroke and Electric Storms in the Tropics.** —*Jl. Trop. Med. & Hyg.* 1925. Apr. 1. Vol. 28. No. 7. pp. 138–140.

The author describes the evolution of a thunderstorm in hot weather; the electrification of the vapour in the higher regions of the atmosphere and the formation of electrified rain-clouds. In bad storms the discharge of lightning from over-charged clouds often precedes the discharge of rain, and then the dangerous moments for the exposed traveller are those just before the rain reaches earth. Sometimes the warm current left by a span of sweating oxen may conduct the electricity, with disastrous results. In the author's experience the warm current of a speeding motor-car may act as a conductor, but in this case the metal of the car is likely to spread the electricity and pass it to the earth without affecting the occupants or even attracting their attention. The author gives instances, respectively, of the fatal consequences of remaining upright in a thunderstorm (instead of lying flat); of the relative security given by streaming wet *clothing* (as of a man defying the rain), compared with the risk implied in a naturally moist *skin* and dry clothing (as of a man taking refuge under a tree); and of the efficacy of artificial respiration in resuscitating men struck insensible by lightning. Artificial respiration, brisk friction to stimulate the heart, and calomel constitute the author's treatment.

A. A.

PFANNENSTILL (S. A.). **A Method of treating Infected Ulcers.**—*Brit. Med. Jl.* 1925. Apr. 18. pp. 732–733. [26 refs.]

Since antiseptics applied direct to an infected ulcer can exercise but a superficial bactericidal influence the author advocated, in 1910, a mode of treatment that ensures the impregnation of such an ulcer with an antiseptic locally liberated from the circulation.

The select antiseptic is iodine, given orâ as iodide of sodium (15 gr. or more 2 or 3 times a day). The iodine in its most potent nascent state is locally liberated from the iodide in circulation by hydrogen peroxide, with which the ulcerated surface is kept wet. The liberation of iodine is helped by slightly acidifying the peroxide—acetic acid, or—for ulcers in the mouth—boric.

The necessary irrigation with peroxide may be maintained, in superficial ulceration, by carefully packing the ulcer with absorbent wool, or in deeply situated ulceration by spraying.

This treatment, which the author recommends for the various specific ulcerations of tropical latitudes, can be applied wherever an ulcerated surface can be kept continuously—or, at least, very frequently—wet with H_2O_2. The author treats laryngeal ulcers this way, though he allows that deeply burrowing tuberculous ulceration of the larynx cannot be permanently cured by his method.

A. A.

DELANOË (E.). **Sur un cas de maladie de Dercum généralisé à tout le corps sauf face, mains et pieds chez une indigène.**—*Bull. Soc. Path. Exot.* 1925. Mar. 11. Vol. 18. No. 3. pp. 246–249. With 1 text fig. [5 refs.]

Account of a Moorish lady of quality, age about 40 to 45, who, soon after the death of her Moorish lord (to whom she had borne 8 children) which occurred when she was about 25, had somehow contracted syphilis at a Turkish bath. The attack was extremely severe; among other things there had been a generalized skin eruption, which had been followed by steadily progressive hypertrophy of the entire integument, excepting that of the face and hands and feet.

The trouble for which she lately sought relief was pain—headache and constant dull pain in all parts of the body, with intolerable fiery torments of exacerbation; these were particularly acute at night and in the joints, and any joint might suffer.

When seen by the author she had become so bloated, especially as to the pendent belly and corresponding posterior regions, that her gait was a swaying waddle with the arms used as balancers. The hypertrophied skin lay in thick, deep, fatty folds, producing on the limbs a sort of "segmented" appearance; it was painful on pressure, but there was no inflammation; in certain parts there was pigmentation, and desquamation in great strips. There was no psychic or nervous trouble and no loss of a naturally lively intelligence; but the general debility was extreme.

After receiving 2·25 gm. of novarsenobenzol in a course of 5 intravenous injections, the first of which gave relief, the patient was sent home with supplies of iodide of mercury. When seen again about 4 months afterwards she expressed herself ravished with her cure. Her pains were relieved, and even the bloated skin was softened.

A. A.

JEWELL (N. P.). **Three Cases of Castellani's Endemic Funiculitis in Kenya Colony.**—*Jl. Trop. Med. & Hyg.* 1925. Apr. 1. Vol. 28. No. 7. pp. 137–138. [1 ref.]

The author believes these cases to be the first reported from East Africa. He has no doubt that the disease is *sui generis*; the appearance of the spermatic cord on operation and the way pus wells up when the cord is incised are characteristic. In one case a diplostreptococcus was found; in none was there sign of bilharzia or filaria. (He admits a similar disease, or a mild type of this, of filarial origin, which recovers without operation and without destruction of the cord.) The condition suggests strangulated hernia. The cases are described. One elderly patient died, though free incision was made. In another case the inflamed spermatic cord was 1½ inches in diameter. The third recovered without the use of the knife.

A. G. B.

CIGNOZZI (Oreste). **I sali arsenicali di bismuto nella cura della sifilide della malaria e delle tuberculosi chirurgiche.**—*Riforma Med.* 1925. May 11. Vol. 41. No. 19. pp. 437–438.

The author has found that in syphilis colloidal bismuth is less active than salts of the metal; that the soluble bismuth salts are inferior to the insoluble; that among the insoluble the most efficacious are the arsenical compounds and the best of all the sodium methylarseniocitrate of bismuth ("metilarsinocitrobismutato sodico"). He injects intramuscularly 2 cc. containing 0·1 gm. of the salt, equivalent to 0·034 gm. metallic bismuth, daily for 10–12 days, then on alternate days another series of 8–10 injections, and a third course of ten, the injection being made every 3–4 days, reaching a total of 2·4–3 gm. in 50–70 days.

In malaria quinine is found to be best for acute attacks, but for chronic and resistant cases the salt above mentioned has given very good results.

In surgical tuberculosis, again, surprising results have been obtained. It is suggested that the drug acts by its special activity relative to the leucocytes and by its "local fibroblastic action." [It is not stated whether the dosage and procedure for the last two conditions are the same as those detailed for syphilis.]

H. Harold Scott.

Sazerac (R.) & Vaurs (R.). **Du rôle de la phagocytose dans l'action du bismuth sur les trypanosomes et les spirochètes.**—*Ann. Inst. Pasteur.* 1925. Jan. Vol. 39. No. 1. pp. 86–100. With 4 figs. [17 refs.]

The authors have already explained (this *Bulletin*, Vol. 21, p. 924) how an injection of a suspension of insoluble bismuth into the peritoneal cavity of rabbit or guineapig is followed by a copious local determination of leucocytes which engulf, fix, and carry off the bismuth. In the present paper they review the history of the subject of phagocytosis and fixation of soluble and insoluble poisons by the leucocytes of immune and immunized animals, from the experimental work of Metchnikoff, Calmette, and Besredka onwards. They also record further experiments of their own on the therapeutic application of this sort of phagocytosis. Rabbits well infected with *Spirochaeta cuniculi* were given intraperitoneal injections of bismuth (0·2 to 0·3 gm. per kgm.); the spirochaetes disappeared in 48 hours and the lesions were healed in 5 or 6 days, just the same as in the case of intramuscular injections. In trypanosome infection the same effects were demonstrated, though cure was not permanent. Rats infected with a strain of *T. brucei* known to be fatal to those animals in 4 or 5 days received the same proportionate dose of bismuth by peritoneal injection on the 3rd day after inoculation: the trypanosomes disappeared from the peripheral circulation in 24 to 48 hours. A relapse occurred 4 to 10 days afterwards, but the trypanosomes disappeared again after another peritoneal injection, and the rats could be thus kept alive from 19 to 29 days.

A. A.

Smith (Henry). **Stone in the Bladder.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 18–19.

One may take the liberty of expressing some of this ripe experience aphoristically.

1. A very small stone or a residual fragment that has escaped detection by a sound will often fall into the open jaws of a small lithotrite.

2. An irrigator is better than an imperfect evacuator; it can be used safely with four feet of pressure.

3. " Why median incision, when there is any amount of room laterally for either a Keith's operation or a lateral lithotomy ? "

4. Facts relating to large stones removed in leading hospitals in India show the mortality after the suprapubic operation to have been over 40 per cent., against 10 per cent. after perineal lithotomy (the general mortality, for litholapaxy, being, in those hospitals, 2 per cent.). Safer than either for abnormally large stones is litholapaxy through a lateral lithotomy incision. " Why is the suprapubic operation so fatal in India ? Simply because we have not got sufficiently good nursing. For a day or two the patient appears to be all right. Then septic diarrhoea sets in, and the end is at hand." In Indian practice it is much better to sew up the suprapubic bladder-wound carefully and drain the bladder " through the breech " for a few days, than to leave the bladder to drain through a suprapubic wound and thus to risk extravasation of urine into the surrounding areolar tissue.

5. Language is a poor medium for teaching the art of using the lithotrite—*verb. sat sap.*

A. A.

ROSSER (Curtice). **Rectal Pathology in the Negro. Incidence and Peculiarities.**—*Jl. Amer. Med. Assoc.* 1925. Jan. 10. Vol., 84. No. 2. pp. 93–96. With 3 figs. [20 refs.]

The population of Baylor Hospital in Texas includes a large negro element, and in this interesting paper the rectal cases of the hospital for a term of 5 years are analysed and compared in their racial (and possibly phyletic) significance. The hospital population for the specified term was 42,002, of which 10 per cent. was negro, and the total number of rectal cases was 1,138, of which 9·14 per cent. were negroes ; the relative (undifferentiated) rectal infirmity was thus not appreciably different from that of whites. The particulars of this rectal disease, however, give some evidence of a predisposition of the negro to form fibrous tissue in excess, or of what the author terms a " fibroplastic diathesis."

In this series of cases pruritus and spastic sphincter did not occur among the negroes, only one instance of cancer was observed, and the incidence of prolapsus (9 per cent.) was the same as in whites. On the other hand, there was among negroes a high percentage of unspecified inflammation, ulcer, abscess, fistula, and rectal stricture. Moreover, treatment of rectal stricture by divulsion or simple dilation only led to increase of fibrosis. Haemorrhoids, though less common in negroes than in whites, were mostly of the hard non-vascular kind in which fibrosis was conclusively demonstrated.

In the ensuing discussion Dr. Rudolph MATAS, who rather discountenanced phyletic generalizations, referred to his own studies of comparative pathology based on 4,280 ano-rectal cases (2,191 whites and 2,089 negroes) at the Charity Hospital, New Orleans, and published 28 years ago. His observations, though they accord in the main with those of Rosser, are not at every point concordant. Haemorrhoids, non-malignant tumours, and prolapse were more frequent among whites, and ordinary pyogenic infections about equal in the two races. Fistula, ulcer, condyloma, papilloma were in excess and non-malignant rectal stricture greatly in excess in negroes—the last probably because of the greater prevalence of syphilis and tuberculosis. Carcinoma (1 per cent. of the total cases) prevailed among negroes. Nine cases of granuloma were all negroes. Dr. MARTIN, of Detroit, emphatically confirmed the marked prevalence of rectal stricture—and stricture of peculiar density—among negroes, and also the relative rarity of haemorrhoids.

A. A.

DAY (H. B.). **The Relation of Nephritis in Egypt to Intestinal Infection.**—*Proc. Roy. Soc. Med.* (Section of Trop. Dis. & Parasit.) 1925. Jan. Vol. 18. No. 3. pp. 1–2.

Of 100 cases of nephritis with oedema studied by the author in recent years at the Kasr-el-Aini hospital in Cairo, 88 appeared to be definitely connected with an antecedent infection ; in many cases there was gross evidence of *Schistosoma mansoni.* In cultures of catheter-urine bacilli of intestinal types were usually the only organisms observed. In treatment, removal of an intestinal focus of infection, though possible only in a minority of cases, had an immediately favourable result ; and small doses of vaccine—preferably autogenous—given by the mouth and on an empty stomach were of striking benefit.

A. A.

MOLLOW (W.). **Zur Behandlung der Chininidiosynkrasie.** [Treatment of Idiosyncrasy to Quinine.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Mar. 1. Vol. 29. No. 3. pp. 135–143.

The author, in his practice in Bulgaria, has had several cases of quinine idiosyncrasy. It may be congenital or acquired, and may follow ingestion only or both oral and parenteral administration. Some authors regard it as a form of anaphylaxis, but the difficulty is that whereas anaphylaxis is a reaction to foreign proteins, drugs are not proteins. He notes that we do not know the form in which quinine is absorbed and circulates in the blood, and that anaphylactic symptoms are not produced by crystalloids, but that a chemical union with proteins to form a colloidal substance is necessary. He assumes, however, on the strength of some observations of BRUCK that the condition is one of anaphylaxis, and on this assumption based his treatment. Five cases of microscopically proved tertian malaria were all, it is stated, intolerant of quinine, the chief manifestation being an itching eruption on the skin, with in one case sneezing and dyspnoea, in another palpitation and in a third vomiting. All received by the mouth 0·5 gm. peptone each morning followed in half an hour by 0·2 gm. quinine hydrochloride, the doses of quinine increasing in number till 1·0 gm. was received in the day ; the result was that after five days, as a rule, the idiosyncrasy had vanished. In one case a year later, the patient being in good health, 0·5 gm. "quinine" produced no symptoms. A case of blackwater was treated in the same way, but, as the author himself observes, there is no reason to believe that the patient would not have tolerated the usual quinine treatment.

[Reference to recent papers on this subject shows that this idiosyncrasy can be overcome in a variety of ways including the small and increasing dose method (this *Bulletin,* Vol. 20, pp. 59,60, 846 ; Vol. 21, pp. 93, 94). Nothing is said of the blood coagulation.]

A. G. B.

CHOPRA (R. N.), BOSE (S. C.) & DE (P.). **Variations in the Potency of Digitalis Preparations in the Tropics.**—*Indian Med. Gaz.* 1925. Mar. Vol. 60. No. 3. pp. 93–97. [14 refs.]

The authors review the history of the subject and describe their methods of experimentation, and conclude that the rapid deterioration of digitalis in a hot climate cannot be so accurately determined by any single laboratory method as it can by clinical tests. They find that deterioration is due to some (still undetermined) change in the digitalis glucosides. Deteriorated tinctures instead of becoming light green and uniformly opalescent on dilution, turn dark; such tinctures are more toxic to cats, intravenâ, but are therapeutically weaker. They state of the tinctures usually employed in India, that the customary dose (5–10 minims three times a day) is far too small to exert the required effect of digitalis within a reasonable time (3 to 4 days), and should be increased to 20–30 minims thrice a day; or in an emergency, when rapid effects are desired, to 45–60 minims till the amount calculated by Eggleston's method is given.

A. A.

BOSE (S. C.). **Clinical Studies on Digitalis in Bengal.**—*Indian Med. Gaz.* 1925. Apr. Vol. 60. No. 4. pp. 147–154. With 1 chart in text.

The author's observations were made on private patients, and though they cannot be so methodical as those obtained in a hospital, they could be followed for longer terms. The author gives his reasons for preferring the tincture, but even the tincture deteriorates, however carefully it be stored. He also gives his reasons for agreement with the opinions that the dosage should greatly exceed the prescribed maximum of the B.P., and that the range of the drug is not limited to cases of auricular fibrillation.

Of 150 cases of heart failure studied in Bengal only 6 per cent. had auricular fibrillation. To obtain prompt results in grave cases the tincture (standarded by and obtained direct from Parke, Davis & Co.) was used in doses of 2 to 3 drachms daily for 5 days. In one case of auricular fibrillation and ventricular tachycardia the patient, a European, had 18 drachms in 13 days, as well as an intravenous injection of strophanthin, before the beat fell to 80. The stage of optimum benefit usually merges in the stage of minor intoxication, and the toxic effects often come on after 2 drachms have been taken daily for more than 7 days. With the tincture as obtained in Bengal it is extremely rare for doses of 15 minims, thrice daily, to produce toxic effects. Senile hearts, cases of marked hypertension, and cases of grave anaemia with fatty degeneration of the heart responded exceedingly well to digitalis. Digitalis may rarely provoke a sudden paroxysmal tachycardia.

A. A.

CHOPRA (R. N.) & BOSE (J. P.). **Observations on the Anti-Diabetic Properties of** *Cephalandra indica* (*Telakucha*).—*Indian Med. Gaz.* 1925. May. Vol. 60. No. 5. pp. 201–202. With 1 text fig. [2 refs.]

The roots and leaves of *Cephalandra indica*, a creeping Cucurbitaceous herb common in India, are prescribed by Bengal practitioners in diabetes. The authors analysed its composition and tested its pharmacological action. The fresh juice did not reduce the sugar in six cases of diabetes, and it is concluded that the plant's reputation depends upon its use in intermittent glycosuria.

A. G. B.

FOLLWEILER (F. L.) & HALEY (D. E.). **Toxicity of the Castor Bean.**—*Jl. Amer. Med. Assoc.* 1925. May 9. Vol. 84. No. 19. p. 1418. [4 refs.]

Three cases are reported of sensitiveness to the poison of the castor bean developed in experimental work in the Department of Agricultural and Biological Chemistry of the Pennsylvania State College. The symptoms were those of severe cold with sneezing, coughing and lachrymation, congestion of bronchi with oppressive breathing, nocturnal paroxysms of suffocation, swelling and pain of joints, abdominal pains, vomiting, aching of teeth. When the subject was removed from the laboratory the symptoms quickly subsided.

A. G. B.

BALFOUR (Andrew). **Presidential Address. The Term "Tropical."**—*Jl. State Med.* 1925. Aug. Vol. 33. No. 8. pp. 360–367.

This is the Presidential Address in the Section of Tropical Diseases of the Brighton and Hove Congress of the Royal Institute of Public Health, held in 1925.

The point of particular interest emphasized by the speaker, after a brief review, seriatim, of the diseases that chiefly engage the attention of authors of textbooks of tropical medicine, is focussed in the following paragraph :—

> "In one sense there is no such thing as tropical medicine, and this section of the Congress should not exist. On the other hand, we can confidently affirm that diseases occurring in the tropics and modified by the tropics and hindering and hampering the tropics are only too real, and are, moreover, of the greatest interest and importance. Therefore it is well that there should be such a section as this, at this Congress held in Brighton."

A. A.

BALFOUR (Andrew). **Vistas and Visions : Some Aspects of the Colonial Medical Services.**—*Glasgow Med. Jl.* 1924. Dec. Vol. 102. pp. 353–374.

In the formal garb of an address to medical students this is a missionary call to medical service in the tropical colonies, and a call never the less alluring, since it is far from exacting any pecuniary sacrifice. The vistas are spacious vistas of a kind where every prospect pleases and only preventable disease in its variety and abundance is vile. The visions are inspiring visions of great opportunities for increasing the kind of knowledge that does not increase sorrow, and of discoveries concerning the causation and prevention of disease always on the horizon. There is no vagueness in these vistas and visions : the lecturer takes the torrid zone in his circuit and pauses at each colony in his eastwards course ; and he deals in considerable detail with particular problems of specific diseases that still require elucidation and study—even such familiar diseases as leprosy, dysentery, and beriberi.

A. A.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE. **Prospectus and Calendar of the Division of Tropical Medicine and Hygiene for the Session 1925-6. 23, Endsleigh Gardens, Euston Road, London, N.W. 1.**—37 pages. With 1 folding table. London: E. G. Berryman & Sons, Ltd., Blackheath Road, S.E. 10.

The main novelties in this novel prospectus and calendar are (1) that the London School of Tropical Medicine—the old Mansonian sapling—appears as a " Division " of the new London School of Hygiene and Tropical Medicine; (2) that the old, rather overgrown and crowded 12 weeks' course has expanded into a course of 20 weeks; and hence (3) that there are two such courses in the academic year, the one beginning in October and ending in February, the other beginning in March and ending in July. The noteworthy differences in the new course are :—

" (1) Much greater attention is paid to Tropical Hygiene, *i.e.*, 31½ hours as compared with 8 hours, and the institution of demonstrations and instruction in the field.

" (2) The inclusion of a short series of lectures on Bio-Chemistry in its relation to diseases and hygiene of the tropics.

" (3) A considerable extension of the Clinical Demonstrations, *i.e.*, 48 hours as compared with 33 hours.

" (4) The introduction of tutorial or seminar weeks during which there is no systematic teaching. Its place will be taken by conferences between teachers and students, by museum and other demonstrations, and by special clinical instruction.

"The student will have time for reading and reflection. Attendance during these tutorial weeks will not be compulsory except for students taking the examination for the D.T.M. & H. (Eng.), but all students are strongly advised to avail themselves of the opportunities which these tutorial weeks present, especially as, during them, such subjects as scientific nomenclature and terminology will be discussed and explained.

" (5) Special instruction in recent advances made in the subjects studied."

A. A.

ABBATUCCI. **L'école de médecine de Pondichéry.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 123–126.

The Pondichery School of Medicine is the oldest native medical school in the French colonies. It was founded in 1823 and has been recognized officially since 1863. Since 1890 the course of studies has been 5 years. It trains native health officers, vaccinators and midwives, and since 1863 has passed out 65 diplomats. It is proposed now to employ its pupils in Indo-China, French West Africa, Madagascar and the Pacific.

A. G. B.

BRUMPT & JOYEUX. **L'assistance médicale indigène dans nos colonies africaines.**—*Bull. Acad. Méd.* 1925. May 5. Year 89. 3rd Ser. Vol. 93. No. 19. pp. 490 500. With 1 chart. [1 ref.]

The thesis of this paper, which is of chief interest to France, is that the prosperity of the colonies depends on manual labour, and the supply of this on a sufficiency of skilled doctors. It appears that while Indo-China is well furnished, with 185, the African colonies are but poorly provided (French West Africa, 92; Equatorial Africa, 37; Togo and Cameroun, 27), and that this difference is due entirely to the low remuneration of the doctors in Africa. Figures are given for each colony and for France, and those of Belgian Congo for comparison, and appear to show that the highest annual income obtainable after 25 years in the French African Colonies is little more than the starting point in Belgian Congo. Of the conditions in British colonies the authors write, "Nous ne parlons pas de l'Angleterre qui paie ses médicins et ses fonctionnaires avec une largesse ne pouvant être comparée à notre parcimonie." They seem to favour the plan of the Dutch and Portuguese governments, who maintain a "study fund" (*bourse d'études*) for young people who agree to go abroad when they have obtained their diplomas. France is the one country which does not insist on its colonial medical officers taking a course at a school of tropical medicine or its equivalent. It will not be possible to obtain sufficient doctors till the salary scale is raised to a point which induces them to leave France. [Things being so, all the more credit is due to the French doctors in Tropical Africa for their steady output of scientific work.]

A. G. B.

THOMAS (Marie). **De suspensiestabiliteit van het bloed in de tropen.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 2. pp. 157–172. With 1 folding table.

After reviewing the relevant literature the author tabulates her own results. In Europeans in the tropics, and in perfectly healthy natives, the sedimentation speed was the same as in Europe, but malaria and hookworm infections even in a slight degree caused a marked acceleration. Therefore normal values were rare in natives, more frequent, however, in the better classes. There is no parallelism between the sedimentation speed and the degree of anaemia. From a clinical point of view the sedimentation test may give aid: (1) In suggesting some slight affection overlooked; (2) for prognostic purposes; (3) perhaps for differential diagnosis, but this requires further study.

W. J. Bais.

RADSMA (W.). **Het suikergehalte van het bloed bij Inlanders en Europeanen in de tropen. (2de Mededeeling.)** [The Blood Sugar Content of Natives and Europeans in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 3. pp. 293–317. [10 refs.]

Previous work of the author together with GOELAM (see this *Bulletin*, Vol. 21, p. 399), showing that the blood-sugar values of natives and Europeans in the Dutch East Indies do not materially differ from European figures, has since been confirmed by HOLTAPPEL (*tom. cit.*, p. 486) and by Teding VAN BERKHOUT (*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië,* 1924, IV). Radsma now quotes his further experience, which is in accordance with his previous report. Cohen Tervaert's method again was found to be useful and correct; some technical details were improved.

It is a well-established fact that glucose is found only in the plasma and not in the chromocytes. To exclude influence of difference in the relative plasma volume in the races under consideration the author determined the same by the haematocrite method and found no difference of any importance in this respect either.

Neither in human individuals nor in rabbits could any difference in the blood sugar level be produced by transfer from low country to the mountains.

Some preliminary experiments are quoted in which a similar blood-sugar curve was found in Europeans and natives after administration of 50 gm. glucose.

W. J. Bais.

RADSMA (W.). **Something about the Chemical Composition of Blood in the Tropics.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1925. Pt.2. pp. 122–125.

The author is of opinion that comparative studies of native blood with European blood in the tropics are more profitable, in the present state of our ignorance, than the premature study of the effect of a tropical climate upon European blood, and he gives here some tabular statements of the results of his analyses of European and native bloods in the Dutch East Indies, as regards intermediate products of metabolism. The analyses show a much higher average content of urea and glucose in European than in native blood and a somewhat higher nitrogen content and a somewhat higher content of glucose in European serum.

A. A.

DJAMIL (Mohd.). **De bepaling van het haemoglobinegehalte en het volumen der roode bloedlichaampjes en den kleurindex van het bloed in de tropen.** [The Determination of the Hemoglobin Content and the Volume of the Chromocytes and the Color Index in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 3. pp. 318–339. [15 refs.]

The author compares the haemoglobin tests of Tallqvist, Sahli and Van Slyke. The first is to be depended upon only as concerns values of over 60 per cent. Sahli's instrument is to be recommended, but it should be regularly standardized every half-year in view of the alteration which the haematine solution undergoes in tropical light. The gasometric method of Van Slyke yielded the most trustworthy results.

Healthy male natives of the Dutch East Indies showed haemoglobin values of 86·45 per cent.–103·84 per cent. (average 96·24 per cent.). The number of erythrocytes amounts to 4,420,000–6,024,000 (average 5,195,000). The volume of the erythrocytes was determined with Hamburger's haematocrite; it was found to be 38 per cent.–50 per cent. (average 42·2 per cent.), Capps' volume index accordingly being lower than 1; it is to be considered abnormal only if under 5/6. The colour index is also slightly lower than 1, in healthy individuals as well as in most cases of anaemia. Only a few cases of serious anaemia were met with, in which the colour index was higher than 1; yet these were not cases of primary pernicious anaemia, but secondary cases generally caused by malaria. Primary pernicious anaemia, if occurring at all, is exceedingly rare in the Malay race. Hookworm disease affects the bone marrow and brings on aplastic conditions of the blood, but never causes the blood picture of pernicious anaemia.

W. J. Bais.

MUKHERJEE (Harendra Nath) & SAHA (Jugal Charan). **Studies in Blood Chemistry of Bengalee Students—Physiological Normals I.**—*Calcutta Med. Jl.* 1925. May. Vol. 20. No. 11. pp. 415–421. [8 refs.]

This paper consists largely of tabulated figures. The authors' summary is that in healthy Bengali youths the non-protein-nitrogen, the urea-nitrogen, and the creatinine content of the blood are lower and the uric acid content is higher than the European standards.

A. A.

DE SOUZA (José Florencio). **Determinação de alguns indices hematológicos normais em indigenas de Goa. (Estudos de hematologia normal.)**—*Arquivos Indo-Portugueses de Med. e Hist. Nat.* Nova-Goa. 1925. Vol. 2. pp. 71–112.

The author has carried out total blood-counts and haemoglobin estimations and evaluated the Arneth Index of 60 indigenous subjects in Goa, apparently in good health, in order to obtain satisfactory haematological standards for three age-periods, namely, 20 for each group between 20 and 45 years, 14 and 20 years, and 7–14 years. The detailed results of each are given. When compared with the usual text-book standards these show certain marked differences. The number of erythrocytes was lowest in the children, but the majority in each of the groups was higher than we have been led to regard as normal. Eight of the first group had over 6,000,000 per cmm., 11 of the second, and 14 of the third. In one instance, 8,400,000 is recorded. The haemoglobin in a large majority of the cases was 90 per cent. or over. The total leucocytes were inclined to the low side, most being below 6,000 per cmm.

The greatest divergences from the generally accepted normal are seen in the proportion of eosinophiles. Of those in the first group (20-45 years) only four had less than 4 per cent., and one had as many as 16. In the second group (14–20 years) more than half had 5 per cent. or more, one showing 29·2 per cent. Three-fourths of the third group (7–14 years) had more than 5, and eight showed between 10 and 20 per cent. If helminthic infection is accountable for this eosinophilia the parasites have not produced anaemia and all the subjects were apparently in normal health. 19 of the 60 were soldiers, the remainder students at school or college. The Arneth Index proved to be within the limits of the normal, namely, II 7, III 53, IV 35, V 6.

H. Harold Scott.

DOEKELMAN (W. A.). **Een merkwaardig geval van eosinophilie.** [A Curious Case of Eosinophilia.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Feb. 28. 69th Year. 1st Half. No. 9. pp. 998–1002.

An officer of the Dutch East Indian army of 6 years' Indian service, who had suffered from malaria and ancylostomiasis and, on his return, from bronchitis with fever and mucous and sometimes sanguinolent expectoration, showed a hyperleucocytosis of 36,400 (Polynuclear neutrophiles 13·7 per cent., eosinophiles 74·8 per cent., lymphocytes 9 per cent., large mononuclears 2.5 per cent., no juvenile forms), splenomegaly, arterial pressure 165 (systolic) and 120 (diastolic), the last (as appeared later) probably due to an intercurrent subacute Bright's disease. Bronchial asthma, helminthiasis, leucaemia, could be excluded as etiological factors.

Treatment with adrenalin brought the eosinophilia temporarily down to 60 per cent., and a diet free of purin to 15·6 per cent. The patient is still under observation. The case is compared with 7 others, among them two described in American and English literature as "persistent eosinophilia, hyperleucocytosis and splenomegaly."

N. H. Swellengrebel.

MOONEY (Harold L.). **Lunacy among West African Natives.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925, Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. p. 89.

For an idea of the relative prevalence of the different mental disorders among West Africans the author gives the result of an examination of 200 patients in the Asylum at Accra, the average population of that Institution being 210.

Mania (Acute, Chronic, Recurrent and Recent)	59
Maniacal (Depressive Psychoses)	16
Melancholia	2
Paranoia	9
Dementia Praecox types	39
Epileptic Psychosis	13
Acute Confusional Insanity	21
General Paralysis	3
Dementia (Secondary, Senile, Organic)	27
Insanity Associated with Visceral Disease	6
Mental Deficiency	5

The male patients outnumbered the females by about 3 to 1.

The large proportion of cases of dementia praecox types the author is inclined to regard as a simian or atavistic character.

A. A.

TRAVAGLINO (P. H. M.). **The Social Importance of Schizophrenia for the Native Society.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 2. pp. 126–131.

The author's argument is that the normal native of the Dutch East Indies is "hypertenacious" and "hypovigilant"; that is to say, that in a series of very swiftly succeeding simple impressions his mind is so overwhelmed by the first one as to be oblivious of the others: for instance, in a procession of motor-cars he very dangerously concentrates his attention on the leader. In the abnormal native mind this "hypertenacity" becomes manifest in the realm of ideas, so that the native is particularly prone to succumb to that state of hostile self-engrossment against the world which characterizes dementia praecox. And, as a matter of fact, 75 per cent. of the criminal inmates of the Lawang asylum during the last 8½ years have been the victims of this dangerous form of insanity. Since in the Dutch East Indies many mentally defective natives are not secluded, this is a fact of great social importance.

A. A.

REED (J. G.). **Case of Congenital Deformity in a Dyak Boy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. p. 90. With 4 figs. on 1 plate.

The deformities here described and figured affect both hands and both feet, being mainly perodactyly in the left hand and both feet and mainly syndactyly in the right hand. There is no family history of deformity, The relatives attribute the deformity to the killing of a tortoise by the father when the mother was seven months' pregnant.

A. A.

PONS (René). **Vaccinothérapie dans les affections gangreneuses à association fuso-spirillaire par un vaccin antispirillaire. Essais thérapeutiques, en collaboration avec les docteurs** LALUNG-BONNAIRE & NGYUEN-VAN-LU.—*Arch. Insts. Pasteur d'Indochine.* 1925. Apr. No. 1. pp 42–47 With 4 figs. on 1 plate. [1 ref.]

The antispirillar vaccine here described and commended is a diluted culture of a polymorph spirillum--said to differ in dimensions and culture-reactions from *S. vincenti*—isolated by the author from the buccal cavity. The vaccine (an emulsion—standardized to 500,000,000 per cc. and heated for half an hour at 53° C.—in 7 per cent. fluoride solution, of a 24-hours' culture) is said to cut short all the phagaedenic manifestations, on mucous membrane and on skin, of the fuso-spirillar (Vincent, Le Dantec) infection. The author has used it in the treatment of the phagaedenic ulcers of Cochin China, noma, membranous stomatitis, Vincent's angina, and alveolar pyorrhoea, also of various other specific ulcers where phagaedena is a complication. In acute ulceration of the mucous membrane its action is rapid, 4 to 5 injections (increasing from 0·5 to 2·0 cc.) being curative in about 5 days ; but in ulceration of the skin its action is slower since it only arrests the phagaedena and does not hasten cicatrization.

A. A.

NOËL (P.) & ANDRÉ (Zéganadane). **La puberté chez les Hindoues.**—*Ann. de Méd. et de Pharm. Colon.* 1925. Jan.–Feb.–Mar.–Apr. Vol. 23. No. 1. pp. 49–54.

The authors inquired into the date of the first menstruation in 1,500 women in the region of Pondichery, Madras. The maximum, 17 per cent., was at 13 years, and 66 per cent. commenced menstruation between 11 and 15 years. They proceeded to test the effect of caste and examined females of six castes from Valangas to Brahmins. They reached the following conclusions : The menses appear later in girls of poor circumstances, compelled to work and badly fed, than in wealthier girls of the same caste. Whether the diet is vegetable or mixed makes no matter. The influence of early marriage is doubtful ; the maximum occurred at 11 years in two castes where early marriage is the custom. They were unable to collect sufficient data from Mussulmans. In 100 cross-breds (Indo-Europeans) there were two maxima, one at 11 and the other at 14 years, a peculiarity which appears to be frequent in race mixtures.

A. G. B.

DONATH (W. F.). **Changes in the Percentage of A-Vitamine and in the Nature of Albumen during the Germination of Katjang-Idjoe** (*Phaseolus radiatus* **L.**).—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1924. Pt. 4. pp. 344–362. With 9 charts. [28 refs.]

The experimental animals were rats. The conclusions are as follows :—

"By the curative and the prophylactic methods for ascertaining the percentage of A-vitamine, a comparison was made between the percentage of A-vitamine in katjang-idjoe, tao–geh [the shooting sprouts of katjang-idjoe] and well-developed katjang-idjoe, and the value of the albumen of the three products as an addition to the shortage of rice-albumen. It was found :—

"1st. That A-vitamine, during the first eight days of germination, is synthesized in the sprouts of katjang-idjoe, and that consequently the percentage of fat-soluble vitamine is considerably higher in tao-geh than in katjang-idjoe.

"2nd. That the amount of A-vitamine increases with the age of the sprouts.

"3rd. That the greater part of A-vitamine is in the stems and the leaves while very little is present in the roots.

"4th. That the faculty of the albumen of compensating the shortage of amino-acids in the rice-albumen, which is entirely insufficient with katjang-idjoe, increases with the age of the sprouts."

A. G. B.

SCHÖBL (Otto). **Semiselective Antiseptic Effect of the Vapors of Vegetable Oils, Essential Oils, their Constituents, and Similar Compounds.**—*Philippine Jl. Sci.* 1925. Apr. Vol. 26. No. 4. pp. 501–505. With 1 folding plate. [1 ref.]

These experiments are a continuation of those described with KUSAMA in a former paper (*ante*, p. 229). Forty-six vapours and 12 microbes were now used. The selective action most evident was in respect of *B. tuberculosis* and, to a certain extent, *B. anthracis*.

"Results of experiments are given concerning the semi-selective antiseptic effect of the volatile constituents of essential oils, vegetable oils, and similar volatile compounds toward *B. tuberculosis*, *B. typhosus*, *B. coli*, *B. dysenteriae*, *Vibrio cholerae*, *B. anthracis*, *B. pyocyaneus*, and Gram-positive and negative pathogenic cocci."

A. G. B.

SMITS (J. C. J. C.). **Pyoktanin als antisepticum.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 3. pp. 340–344. [6 refs.]

The author has already recommended the use of pyoktanin in 1892. He now once more emphasizes the striking antiseptic action of this anilin dye in aqueous or alcoholic solution of 5–10 per cent. He noticed neither the alleged necrotic action of the drug nor secondary eczema of the treated parts and quotes a case of necrotic tendovaginitis of the forearm in an elderly Javanese woman, in which the infection was abated within three weeks' time.

W. J. Bais.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1925. Vol. 65. No. 3. pp. 363–380.—**Uit het Jaarverslag van het Centraal Militair Geneeskundig Laboratorium over het jaar 1924.** [From the Annual Report of the Central Military Medical Laboratory on the Year 1924.]

This report contains a record of the many activities of the laboratory, mostly for practical purposes, but few points of general interest.

A non-agglutinable strain of paratyphoid A bacillus was isolated from the blood in a case which behaved clinically like typhoid fever. It was not demonstrated that this strain was the causative agent.

In a clinical case of kala azar (very rare in the Dutch East Indies) the Leishmania was cultivated from blood, liver and bone marrow.

W. J. Bais.

CORNWALL (J. W.). **How can the Exponents of Western Medicine and of Ayurvedic Medicine be reconciled?**—*Trans. S. Indian Branch Brit. Med. Assoc.* 1925. Vol. 17. No. 3. pp. 125–132.

A useful piece of dialectics. The author states the postulates of all rational argument as distinguished from sentimental dispute; and as regards the pure Ayurvedic doctrine he decides that, so far, no competent Indian scholar has been able to present in English such a statement of it as is necessary for comparison with western medical practice seeking always to be based on demonstrable fact. In such circumstances commonsense will approve the conclusion that "judging from the history of scientific achievement in general it seems scarcely probable that any [scientific] hypothesis could remain unchanged, unchallengeable and satisfying for a period of, let us say, 2,500 years."

A. A.

AFFRE. **Sur la possibilité d'utiliser au Sénégal le lait d'ânesse dans l'alimentation des nourrissons malades.**—*Bull. Soc. Path. Exot.* 1925. June 10. Vol. 18. No. 6. pp. 507–509.

The author proposes that in places—such as Dakar, whence he writes—where wet-nurses are likely to be tainted and verminous, and cow-milk is a priceless rarity, the milk of that inexpensive and cosmopolitan domestic drudge, the ass, should be adopted for the treatment of infants suffering from bowel-disorders. The particular fitness of ass-milk for human consumption is generally allowed, and the only objection against it, that the author can think of, is that it is not amenable to ordinary processes of sterilization.

A. A.

OUDENDAL (A. J. F.). **Crystals and Pigments in Living Tissues.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1925. Pt. 1. pp. 1–20. With 23 plates.

This paper is remarkably well illustrated by coloured plates of the crystals and pigments described.

In the first instance the author describes the appearances of the liver of a young native female victim of pulmonary tuberculosis. Besides the usual tubercles, it contained a small abscess surrounded (and also permeated) by innumerable small Charcot-Leyden crystals associated with giant-cells apparently attacking the crystals.

The greater part of the paper, however, is concerned with descriptions and digressional discussions of the conditions accompanying deposits of cholesterine-ester crystals in spleen and thyroid, as seen in the spleen of a patient with a post-mortem diagnosis of malaria and amoebic dysentery, and in an enormous sarcomatous thyroid removed from a native woman by operation. Here the masses of crystals were found in haemorrhagic and necrotic foci surrounded either by giant cells or connective tissue. Along with them, and also in the walls of the blood-vessels, were remarkable accumulations of fat and haemosiderin. Similar changes have been observed by the author in the spleens of patients dying of other diseases than malaria, and the accumulations of iron pigment have been observed to give rise to proliferation of connective-tissue so as in some cases to cause an "enormous extension of the trabeculae." "Taken as a whole the impression is raised that the tropical spleen is the scene where a far-going and extensive blood-destruction takes place."

The author's post-mortem-room experience leads him to think that even in such spleens all the destroyed blood is not "consumed." The neighbouring lymphatic glands, the liver and the lymphatic glands in its vicinity, the kidneys and the lungs may be charged with superfluous iron pigments. He does not wish to suggest that these pathological changes observed in the spleen are restricted to malaria. But if "malaria should be the cause of all the pigmentations with iron compounds, the frequent presence of iron pigments in the epithelial cells, and in the cylinders [kidneys] throws a special light on the origin of ferruginous urine in such patients. Probably this anomaly also holds the key to another problem, viz., the haemoglobinuria in blackwater fever."

A. A.

GUDGER (E. W.). **Stitching Wounds with the Mandibles of Ants and Beetles. A Minor Contribution to the History of Surgery.**—*Jl. Amer. Med. Assoc.* 1925. June 13. Vol. 84. No. 24. pp. 1861–1864. [14 refs.]

The following is the author's summary of an interesting paper :—

> "Herein are brought together definite citations to show that the use of living ants to bite fast and thus suture wounds persists to-day in northern South America, was prevalent on the southern and eastern shores of the Mediterranean from 80 years ago down to 30 years ago, was the standard practice in Spain, France and Italy in days just preceding the coming of Renaissance times, and reaches back to remote antiquity in India—that its time span is from A.D. 1921 to 1000 B.C., a range of nearly 3,000 years.
>
> "Verily there seems to be nothing new under the sun."

A. A.

MCCONNELL (W. J.) & YAGLOGLOU (C. P.) assisted by FULTON (W. B.). **Basal Metabolism before and after Exposure to High Temperatures and Various Humidities.**—*Public Health Rep.* 1924. Dec. 5. Vol. 39. No. 49. pp. 3075–3088. With 6 figs. [9 refs.]

The observations recorded deal with the respiratory exchange during rest, and were made on human subjects. The paper speaks of 10 subjects, but only 8 appear in the tables of data, and most of these relate to only 2 of them.

The subjects went without breakfast, were recumbent in light clothing for two hours in a room of ordinary temperature (not stated) and samples of expired air were then collected ; they passed into a second chamber of constant high temperature and humidity, where they remained one or two hours, and second samples were collected, and compared with the first. They were not able to stand the higher temperature (105°) for more than an hour. All experiments were made in still air. The air temperature was taken with dry-bulb and wet-bulb thermometers, and the results are stated for what is called "effective temperature" mid-way between the two. This simplifies such observations. It was found that the zone of minimum metabolism was between 75° and 83° "effective temperature"; therefore basal metabolism should be measured under these conditions. The CO_2 produced and oxygen consumed, as also the heat-production rise with exposure to low temperatures, which is what one would expect. The same result follows exposure to high temperatures, especially when the air temperature exceeds the body temperature. This evidently puzzled the authors, but if they had studied their own tables, they would have discovered the cause; for the body temperature of their subjects rose (in some cases to over 102°), their heart-rate increased to 150 or thereabouts, and their glandular activity was raised also. Extreme sweating was noticed, and interpreted as an effort of nature to prevent a rise of body temperature. It may have been so, but, at any rate, their subjects were not in a condition of basal metabolism, but in a condition of extreme muscular and secretory activity, and the rise of rectal temperature was attended with the usual increase of chemical activity. Another point noted is a rise in the respiratory quotient which they explain, probably correctly, by a conversion of carbohydrate into fat, another indication they were not dealing with normal metabolism.

The research is of some interest from the academic point of view, but to those who deal with conditions in the tropics it is not of much practical importance. A fasting man put into a hot room for an hour or two is a different proposition from one who has to exist in a tropical climate.

W. D. Halliburton.

Benedict (Cornelia G.), Benedict (F. G.) & du Bois (E. F.). **Some Physiological Effects of Hot Air Baths.**—*Amer. Jl. Physiol.* 1925. Vol. 73. No. 2. pp. 429–448. [7 refs.]

McLeod (Grace), Crofts (Elizabeth E.) & Benedict (F. G.). **The Basal Metabolism of some Orientals.** *Ibid.* pp. 449–462. [23 refs.]

The work detailed in the first of these communications is mainly of theoretical importance, and is chiefly interesting to readers of this Journal because it stimulated Dr. Benedict and his co-workers to study the basal metabolism of nine Oriental women (7 Chinese and 2 Japanese) who had emigrated to America. Their vital or respiratory capacity was low, but pulse, respiration rate, blood-pressure and other standard measurements presented nothing unusual. The basal metabolism was remarkably low, and this question has frequently cropped up in other researches abstracted for the *Bulletin* by the reviewer. The average was 10 per cent. below the Harris and Benedict prediction standard. By other standards also there was essentially the same picture. There was nothing to indicate abnormality, but the persistent low metabolism appears to be characteristic of the Oriental, and transplantation to another climate does not alter this inherited trait. Sex is an undoubted factor, and leads the authors to believe that the present standards for American women are too high, approximately 5 per cent. too high. The importance of age and sex has been recognized before; it appears now that a racial effect must be added to these.

W. D. Halliburton.

FLINN (Frederick B.). **Some Effects of High Environmental Temperatures on the Organism.**—*Public Health Rep.* 1925. May 1. Vol. 40. No. 18. pp. 868-896. With 1 text fig. [54 refs.]

The results given in this paper are mainly of academic interest, since they relate to the dog. The author admits that the means of heat-loss in this animal are different from what they are in man, but thinks such differences are mainly quantitative only. His observations at present relate to the blood only; he is to continue them with other tissues such as the changes in the central nervous system. The results hitherto obtained may be briefly summarized as follows:—

Exposure for 6 hours to 20°–30° C. (68°–86° F.) caused the body temperature to drop, probably owing to lessened muscular activity; at 40° C. (104° F.) caused a rise of 1° C. in body temperature; at 45°–50° C. (113°–122° F.) the body temperature rose within an hour so much that it was not deemed safe to continue the experiment. Data are also given of the oxygen capacity, the oxygen content, the alkali reserve, the CO_2 content, the hydrogen ion concentration, the sugar and solids of the blood at these various temperatures, but nothing unexpected was noted. Increased air movement delays any deleterious effects, so also does the free drinking of water (temperature of water not stated).

W. D. Halliburton.

KOROBKOVA (E.). **Sur les résultats différents d'immunisation par voie digestive.**—*Rev. Microbiol. et Epidémiol.* Saratov. 1925. Vol. 4. No. 1. In Russian pp. 30–33. French summary pp. 34–35.

The author notes that some workers have been unable to demonstrate agglutinins in the blood of animals to which they have administered dried vaccines per os. He suggests that dried vaccines are not absorbed unless they are given in a state of fine division. He gave dried antityphoid vaccine per os to rabbits (*a*) finely divided, (*b*) merely dried, and found that agglutinins were present 10 days after a course of 3 doses in the first series, but not in the second. The dose of organisms must not be less than 100–150 milliards.

A. G. B.

SILER (J. F.). **Review of the Reports of the 1924 Annual Physical Examination of Officers on Duty in the Philippine Islands.**—*Milit. Surgeon.* 1925. May & June. Vol. 56. Nos. 5 & 6. pp. 558–576. With 5 charts in text. pp. 738–754. With 3 charts in text.

The officers in question numbered 676. Among the conclusions reached were the following:—

" 1. Seventy per cent. of the officers in the Philippine Department had been in active service, as such, for a period of less than ten years.

" 2. A very large proportion of the officers examined had errors of refraction but practically all were wearing eye-glasses fitted with correct lenses . . .

" 3. It was found that a larger percentage of officers on duty in the Philippine Department had defective hearing than was the case for all officers of the Army (49 per 1,000, as compared with 38 per 1,000). . . . .

" 5. There was a marked tendency to underweight as 67 per cent. of the officers in the Department weighed less than the normal average for their age and height. Assuming that a maximum variation in weight of 10 lbs. below or above the normal average can be considered as within normal limits, 43 per cent. of the officers were underweight (more than 10 lbs. below average), 40 per cent. were within normal limits, and 19 per cent. were overweight (more than 10 lbs. above average). A very definite correlation between weight and height was demonstrable in the case of officers who on the one hand were markedly underweight, and on the other were quite tall (70 ins. or more) . . .

"6. The occurrence of hemorrhoids in officers in the Philippine Department as compared with all officers of the army was as 2 is to 1 (98 per 1,000 officers, Philippine Department, 44 per 1,000 all officers).

"7. The systolic blood pressure of officers serving in the Philippines is, as a rule, considerably lower (5 to 10 points) than the systolic pressure of groups of individuals of comparable ages residing in temperate or cold climates. Seventy-six per cent. of the officers of this group had systolic pressures below the average for their respective ages. The hypotension rate of 760 per 1,000 for officers serving in the Philippine Islands is more than five times greater than that noted for all officers during the 1923 annual examination.

"8. A significant correlation was noted between underweight and low systolic blood pressure on the one hand and overweight and high systolic pressures on the other. It is probable that low blood pressures in tropical climates are due to general relaxation resulting from exposure to continuously high temperatures and excessive humidity.

"9. Organic lesions of the heart and other diseases of the heart and blood vessels were but rarely noted, 15 per 1,000 individuals examined (10 of 676).

"10. The reported rates for pulmonary tuberculosis (inactive, 12 per 1,000; active, 5 per 1,000) were very much higher than the rates for all officers noted during the 1923 annual examinations (inactive, 1·83 per 1,000; active, 1·42 per 1,000).

"11. Neurasthenia was reported in six cases, 10 per 1,000 of individuals examined. The reported rate for all officers for the 1923 annual physical examination was only 1·3 per 1,000."

A. G. B.

ABBATUCCI (S.). **La médecine aux colonies françaises. La politique française du quinquina.**—*Presse Méd.* 1925. June 13. Vol. 33. No. 47. p. 795.

The quinine purchases of the French Colonial department amount to 4,535 kilos, or 2,222,594 francs. It is calculated that if it were desired to submit every inhabitant of French West Africa to a régime of preventive quinine for 4 months it would cost 180,000,000 francs. In any case, it is improbable that the world production of quinine would suffice; the Dutch East Indies, the chief source, in 1924 produced 620,800 kilos. France should endeavour to grow its own cinchona, and the author names the conditions necessary for its cultivation: a warm damp climate with constant temperature at an elevation of 1,000–1,800 metres; a site sheltered from wind and the direct rays of the sun; a siliceous-argilaceous soil, rich in humus, fairly permeable, not allowing stagnation of water, preferably volcanic. He would have missions to prospect for such places in the French tropics.

A. G. B.

REVIEWS AND NOTICES.

WERNER (Louis). [M.B., F.R.C.S.I., Sen. Mod. Univ. Dub., Surgeon to the Royal Victoria Eye and Ear Hospital, Dublin, etc.] [Edited by.] **Swanzy's Handbook of the Diseases of the Eye and their Treatment.** 13th Edition.—pp. xvi+698. With 279 text figs. & 9 coloured plates. 1925. London: H. K. Lewis & Co., Ltd. [Price, 21s. net.]

SWANZY'S "Diseases of the Eye" has for many years served as a most reliable and readable textbook to which practitioners can refer in cases of difficulty. In the new edition of the work Werner has preserved all the best characteristics of the previous issues, and has brought the book well up to date by including most of what has been found to be of value in recent practice. Many minor alterations and additions have been made to the text, whilst much of the section on diseases of the uvea has been entirely rewritten. The size of the book, however, has only been increased by some twenty odd pages. The description of operations upon the eye is excellent, especially that of sclero-corneal trephining. Surgeons, however, who quite frequently perform an iridectomy as a preliminary to the extraction of a senile cataract, are unlikely to agree with the statement that this procedure renders it more difficult to raise a conjunctival flap at the subsequent operation, and that it is liable to cause adhesion of the pillars of the coloboma to the angles of the wound. A preliminary iridectomy may actually facilitate the safe extraction of the lens beneath a "bridge flap" of conjunctiva; and, if the preliminary operation was successfully performed, there should be no unusual difficulty in securing a proper replacement of the pillars of the iris. A textbook which has gone into thirteen editions requires no commendation, but its editor may be congratulated on his production of a comprehensive, clearly-written, and concise work which very fully maintains the high standard of the previous issues.

H. Kirkpatrick.

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The bracketed abbreviations after the page numbers indicate the subject. Page numbers within brackets indicate papers not summarized.

Am.	signifies	Amoebiasis and Amoebic Dysentery.
Bb.	,,	Beriberi.
Bl.	,,	Blackwater.
B.R.	,,	Book Review.
Chl.	,,	Cholera.
Der.	,,	Tropical Dermatology.
Diet.	,,	Native Dietaries.
Dys.	,,	Dysentery (Bacillary and Unclassed).
Ent.	,,	Enteric Fevers.
Fev.	,,	Fevers.
Hel.	,,	Helminthiasis.
H.S.	,,	Heat Stroke.
Jaun.	,,	Infectious Jaundice.
K.A.	,,	Kala Azar.
Lab.	,,	Laboratory Methods & Reports.
Lep.	,,	Leprosy.
Mal.	signifies	Malaria.
Misc.	,,	Miscellaneous.
Oph.	,,	Tropical Ophthalmology.
Pel.	,,	Pellagra.
Pl.	,,	Plague.
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Sc.	,,	Scurvy.
Sp.	,,	Sprue.
S.S.	,,	Sleeping Sickness.
Syph.	,,	Syphilis in Natives of Warm Countries
Tb.	,,	Tuberculosis.
Und.	,,	Undulant Fever.
Ys.	,,	Yaws.
Y.F.	,,	Yellow Fever.
Z.	,,	Medical Zoology.

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de Castro, A. B., 62 (Mal.), 392 (Ent.)
Catanei, A., 63 (Mal.)
——, with Sergent, Et. & Edm., 819 *bis* (Mal.)
——, with Sergent, Ed. & Et., Parrot & Foley, 400 (Mal.)
——, with ——, —, ——, ——, & Sénévet, 38 (Mal.)
Cathala, with Teissier, Reilly & Cambessédès, 773 (Pl.)
Catsaras, J., 235 (Der.)
Caussade, G., & Tardieu, A., 412 (Mal.), 736 (Am.)
Cavanaugh, G. W., Dutcher, R. A., & Hall, J. S., 933 (Sc.)
Cawston, F.G., 421 (B.R.), 462 *ter*, 467, 472, (504) *bis*, 867, 869, 871 (Hel.), 580 (Lep.)
Cazeneuve, H. J., 120 (Und.)
Céard, L., 698 (K.A.)
——, with Foley, 667 (Misc.)
Cedercreutz, A., 569 (Lep.)
Cerruti, C., with Bastai, 941 (Und.)
Chagas, C., 134 (S.S.), 277 (Z.)
Chahovitch, X., 930 (Bb.)
Chalam, B. S., 58 (Mal.)
Champion, W. M., with Gerstenberger & Smith, 109 (Sc.)
Chandler, A. C., 501, 888, 889 (Hel.)
——, with Chopra, 672 (Misc.)
——, & Mukerji, A. K., 458, 895 (Hel.)
Chapcheff, C., 707 (R.F.)
Charles, R. H., 427 (Tb.), 634 (Misc.)
Charlton, N. B., with Cilento & McIntosh, 320 (Lab.)
Charrier, H., (412) (Mal.), 901 (Z.)
Chassigneux, A., with Bedier, 244 (Rab.)
Chatterjee, A. C., 697 (K.A.)
Chatterjee, S. N., 385, 767 (Chl.)
Chauffard, A., & Clément, R., 739 (Am.)
Chavarría, A. P., with Barrera, 216 (Lep.)
Chesterman, C. C., 139, 532 (S.S.), 670 (Misc.)
Chiadini, M., 678 (Misc.)
Chiang, H. T., 663 (Misc.)
Chiang, S. F., 743 (Am.)
Chin Em Po, 474 (Hel.)
Choksy, N. H., 774 (Pl.)
Chopra, R. N., with Acton, 389 (Ch.), 403, 814 (Mal.) 582 (Bb.)
——, & Bose, J. P., 994 (Misc.)
——, ——, & De, P, 993 (Misc.)
——, with De, 671 (Misc.)
——, & Chandler, A., 672 (Misc.)
Chosa, N., 984 (Misc.)
Chou, C. H., 948 (Oph.)
Chown, G., 294 (Z.)
Christie, E. M., 40 (Mal.)
Christophers, S. R., 35, 396, (Mal.), 287, 288, 904 (Z.)
——, with Fletcher, Sen, Andrews, Edwards, Richards & Howard, 898 (Z.)
——, Shortt, H. E., & Barraud, P. J., 683 (K.A.)
Christopherson, J. B., 472, 870 (Hel.)
Chuhar Singh, J., 919 (Z.)
Chuma, M., & Gujo, K., 860 (Lep.)
Chun, J. W. H., 163 (Misc.)
——, with Wu Lien Teh & Pollitzer, 775 (Pl.)
Cignozzi, O., 398, 811, 990 (Mal.)
Cilento, R. W., 36 *bis* (Mal.)
——, McIntosh, R. D., & Charlton, N. B., 320 (Lab.)
Ciuca, M., & Balteanu, I., 386 (Chl.)
Ciurea, T., & Dinulescu, G., 288 (Z.)
Clapier, P., with Beurnier, 551 (Ys.)
Clark, H. C., 558 (Syph.), 730 (Am.)
——, with Barber & Komp, 820 (Mal.)
Clark, L. T., with Gruhzit, 306 (Lab.)
Clark, R. M., 824 (Mal.)
Clarke, J. B., 945 (Fev.)

Claude, H., & Targowla, R., 824 (Mal.
Clearkin, P. A., 510 (Und.), 945 (Fev.)
Cleland, J. B., 274 (Z.), 350 (Am.)
Clément, R., with Chauffard, 739 (Am.)
Clementi, C., 83 (B.R.)
Clemow, F. G., 384 (Pl.)
Cleveland, L. R., 835 836, (924) (Z.)
Coates, V., 33 (Sp.)
Cobb, C. E., 99 (Bb.)
Codet, H., 332 (Misc.)
Cohen, with Marchoux, 404 (Mal.)
Coleman, R. B., & Bateman, J. E., 663 (Misc.)
Collazo, J. A., with Funk & Kaczmarek, 585 (Bb.)
Collier, W. A., 145, 535 (S.S.), 710 (R.F.)
——, with Kudicke & Strauss, 146 (S.S.)
Collier, W. T., 181 (Fev.)
Collin, 447 (Oph.), 950 *bis*, 953 (Oph.)
Collin, L., 876 (Hel.)
Colombani, 849 (Lep.)
Colopo, G., with de Mello & Bras de Sá, (520) 945, 946 (Fev.)
Columbia University in the City of New York, 323 (Misc.)
Comby, J., 324 (Misc.)
Comenge Gerpe, R., 49 (Mal.)
Comptes Rendus du 4-ième Congrès antipesteux, Saratov, 382 (Pl.)
Conn, H. J., 305 (Lab.)
Connal, A., 787 (Lab.)
Connell, S. J. B., & Zilva, S. S., 108 *bis* (Sc.)
Connor, C. L., 121 *bis*, 521 (Fev.)
Connor, R. C., & Bates, L. B., 745 (Dys.)
Conseil, E., with Burnet, 155 (Misc.), 513 (Und.)
——, with Gobert, (383) (Pl.)
Cook, C., 213, (Lep.)
Cooke, F. H., 541 (Pel.), 640 (Misc.)
Cooke, W. E., with Low, 483 (Hel.)
Cookson, H. A., with Patton, 911 (Z.)
Cooling, L. E., 282, 302 (924) (Z.)
Cooper, G. F., with Butler & Houghton, 233, (802) (Der.)
Copeman, S. M., 881 (Hel.)
Cordey, A., with Courcoux, 183 (Jaun.)
Corinaldesi, S., 180 (Fev.)
Corlette, C. E., 543 (Pel.)
Cornil, L., with Botreau-Roussel, 651 (Misc.)
Cornwall, J. W., 699, 702 (Rab.), 1003 (Misc.)
Correia, A. C. G. da S., 445 (Tb.), 528 (S.S.), 564 (Lep.), 625, 680 (Misc.), 725 (Y.F.)
Corrigan, S. H., & Corrigan, C. E., 411 (Mal.)
Corson, J. F., 318 (Lab.)
Corwin, 242 (Rab.)
Costa, A. R., with de Mello, Paes & Rebello, 636 (Misc.)
da Costa, A., 767 (Chl.)
da Costa, A. F. W., 126 (Fev.)
Costa, S., Boyer, L., & van Deinse, F., 748 (Dys.)
Couch, J. F., with Ransom & Harrison, 488 (Hel.)
Courcoux, A., & Cordey, A., 183 (Jaun.)
Couvy, 772 (Pl.)
Couvy, L., 13 (Am.), 331 *ter* (Misc.)
Coventry, F. A., 840 (Z.)
Cowdry, E. V., 918 (Z.)
Cragg, F. W., (924) (Z.)
Craik, R., 57 (Mal.)
Cram, E. B., 883 (Hel.)
——, with Hall, 864, 866 (Hel.)
Cran, J., 724 (Y.F.)
Crepin, J., 114 (Und.)
Crittenden, 803 (Mal.)
Crofts, E. E., with McLeod & Benedict, 1005 (Misc.)
Crovato, G., with Guggiari, 494 (Hel.)
Cruickshank, J. A., with Cunningham & Ramakrishnan, 646 (Misc.)
Cruickshank, M. M., 950, 952 (Oph.)
Crutchfield, E. D., 924 (Z.)
Cruz, J. da C., 21, 22, 749 (Dys.)
Cruz, J. Z. S., (392) (Ent.)
Cullen, J. P., 471, 868 (Hel.)
Culpepper, M. B., 299 (Z.)
da Cunha, A. M., 367 (Dys.)
Cunningham, J., 788 (Lab.)
——, Cruickshank, J. A., & Ramakrishnan, S., 646 (Misc.)
——, & Pundit, S. R., 685 (K.A.)
——, & Raghavachari, T. N. S., 309 (Lab.)
——, & Ramakrishnan, S., 237 (Der.)
——, & Theodore, J. H., 153 (Misc.)
——, ——, & Krishnan, K. V., 14, 753 (Dys.)
Curasson, G., 779 (Lab.)
Curasson, with Remlinger, 242 (Rab.)
Curjel, D. F., & Acton, H. W., 231 (802), (Der.)
Curson, H. H., 292 (Z.)

D

Dale, H. H., 326 (Misc.)
van Dam, S., with Bobbert, 164 (Misc.)
Danel, L., 206 (K.A.)
Dang van Cúóng, with Montel & Tran van An, 407 (Mal.), 930 (Bb.)
Danheim, B. L., 879 (Hel.)
Danisch, F., 366 (Dys.)
Dargein & Doré, 514 (Und.), 739 (Am.)
Darleguy, with Vialard, 743 (Am.)
Darling, S. T., 342, 803 (Mal.)
Das, J., with Brahmachari, 199 (K.A.)

Das Gupta, B. M., with Knowles, 194, 195 (K.A.), 332 (Misc.)
Dastidar, S. K. G., 838 (Z.)
Daudy, R., 807 (Mal.)
Daumas, with d'Oelsnitz, Liotard & Puech, 687 (K.A.)
Davey, J. B., Iles, M., McNaughton, J. G., & Moole, Y., 558 (Syph.)
Davidson, T. W., 408 (Mal.)
Davies, E. A., & Bell, P., 655 (Misc.)
Davis, A. E., 951 (Oph.)
Davis, G. E., 780 (Lab.)
Davis, N. C., 330 (Misc.), 499, 504 (Hel.)
Dawbarn, M. C., 545 (Pel.)
Day, H. B., 993 (Misc.)
De, N. K., with Muir, Landeman, Roy & Santra, 223 (Lep.)
De, P., with Chopra, 671 (Misc.)
——, with —— & Bose, 993 (Misc.)
Deeks, W. E., 77, 622 (Misc.), 400 (Mal.), (505) (Hel.), 764 (B.R.)
——, with James, 343 (Am.)
Degorge, A., 739 (Am.)
van Deinse, F., with Costa & Boyer, 748 (Dys.)
Dekester, with Martin, 214 (Lep.)
——, & Melnotte, P., 206 (K.A.)
Delamare, G., 176, 178, 179 (R.F.), 255 (B.R.), 571, 577 (Lep.)
——, & Achitouv, 486 (Hel.), 580 (Lep.), 717 *bis* (R.F.)
—— & Djémil, S., 486 (Hel.), 572 (Lep.)
——, & Mouchet, 881, (897) (Hel.)
Delanoë, 29 (Dys.)
Delanoë, Mme., 237 (Der.)
Delanoë, E., 990 (Misc.)
Delanoë, L., 982 (Misc.)
Delanoë, P., 301, 915, 916 (Z.)
Delf, E. M., 109, 591 (Sc.)
Demaria, E. B., 447 (Oph.)
Denoyelle, L., with Labbé, 883 (Hel.)
Denton, J., 545 (Pel.)
Dervis, T., 479 (Hel.)
Descazeaux, M. J., 918 (Z.)
Deschiens, R., 278 (Z.)
——, with Le Noir, 272 (Z.), 365 (Dys.)
——, with Neveu-Lemaire, 876 (Hel.)
——, & Taillandier, O., 886 (Hel.)
Desoil, P., 294 (Z.), 875 (Hel.)
Destéfano, F., & Vaccarezza, R. F., 502 (Hel.)
Detre, L., 47 (Mal.)
Deusch, G., 873 (Hel.)
Deuskar, V. N., 828 (Mal.)
Dew, H. R., 480 (Hel.)
——, Kellaway, C. H., & Williams, F. E., 873 (Hel.)
Dhairyam, J., 827 (Mal.)
Diacono, H., 320 (Lab.)
Dias, E., Libanio, S., & Lisbôa, M., 922 (Z.)
Dickinson, R. F., 490 (Hel.)
Dickson, W. E. C., with Beattie, 926 (B.R.)
Diehl, K., 356 (Dys.)
Dieterich, F. H., 726 (Y.F.)
Dieudonné, A., & Weichardt, W., 596 (B.R.)
Dimitracoff, C., 465 (Hel.), (718) (R.F.)
Dinulescu, G., with Ciurea, 288 (Z.)
Dixon, O. J., 293 (Z.)
Dixon, W. E., 634 (Misc.)
Djamil, M., 500 (Hel.), 998 (Misc.)
Djémil, S., with Delamare, 486 (Hel.), 572 (Lep.)
Doekelman, W. A., 999 (Misc.)
Doi, Y., with Umeno, (252) (Rab.)
Dolbey, R. V., & Mooro, A. W., 325 (Misc.)
Dold, H., 84 (B.R.)
Domingo, P., 118 (Und.)
——, & Lopez, C., 514 (Und.)
Dominique, H., with Peltier, 486 (Hel.)
Donath, W. F., 1001 (Misc.)
——, with Jansen, 64, 65 (Diet.)
Dong-Ngoc-Dieu, with Millous, 950 (Oph.)
Donner, S., (412) (Mal.)
Dopter, 366 (Dys.)
Doran, G. W., 459 (Hel.)
Doré, G. K., with Dargein, 514 (Und.) 739 (Am.)
Dore, S. E., 216, (581) (Lep.)
Dorward, W. F., 876 (Hel.)
Dostrowsky, A., 696 (K.A.)
Douglas, A. R. J., 565 *bis* (Lep.)
Dowling, 803 (Mal.)
Dowling, O., 42 (Mal.)
Dragten, S., 715 (R.F.)
Drbohlav, J., 727 *bis* (Am.)
——, with Boeck, 727 *bis* (Am.)
Drummy, M., with Williams, B. G. R., Williams, E. M., & Tiburtia, 303 (Lab.)
Dubois, A., with Bruynoghe, 713 (R.F.), 840 *bis* (Z.)
du Bois, E. F., with Benedict, C. G., & Benedict, F. G., 1005 (Misc.)
Duggan, 803 (Mal.)
Duke, H. L., 528, 529, 530 (S.S.), 786 (Lab.)
Dukelsky, O., 539 (S.S.)
Dumitresco-Mante, 411 (Mal.)
Duncan. J. T., 510 (Und.)
——, with Brown & Henry, 307 (Lab.)
Dunham, G. C., 621 (Misc.)
Dupuy, 484 (Hel.)
Duran, C., 32 (Sp.)
Duroeux, L., 405 (Mal.)
Dutcher, R. A., with Cavanaugh & Hall, 933 (Sc.)

Dutrey, M., with Pontoizeau, 517 (Fev.)
Dutt, K. C., 583, (588) (Bb.)
Dutt, M. M., 197 (K.A.)
Dutton, L. O., (368) (Dys.)
Duval, C. W., & Harris, W. H., 516 (Fev.)
——, with Harris, 516 (Fev.)
Dyar, E. G., with Lewis & Hubbard, (413) (Mal.)
Dyar, H. G., 904 *bis* (Z.)
Dyer, H. A., with Voegtlin & Miller, 142 (S.S.)

E

Easmon, M. C. F., 454, 497 (Hel.), 964 (Misc.)
Edwards, F. W., 283 (Z.)
Edwards, J. T., with Fletcher, Sen, Christophers, Andrews, Richards & Howard, 898 (Z.)
Eggleton, P., & Gross, L., 931 (Bb.)
Eguchi, C., 354 (Am.), 358 (Dys.)
Eguchi, S., & Takagi, S., 477 (Hel.)
Eichhorn, A., 704 (Rab.)
——, & Lyon, B. M., (252) (Rab.)
Elders, C., 370, 763 (Sp.)
Eldridge, W. W., Lind, J. E., Silk, S. A., & Trentzsch, P. J., 824 (Mal.)
Elliot, R. H., 446 (Oph.)
Ellis, A. G., with Mendelson, 147 (Misc.)
Ellis, H. A., 846 (B. R.)
Elwes, F. F., 332 (Misc.)
Emile-Weil, P., & Lamy, A., 12 (Am.)
d'Empaire, A., 516 (Fev.)
Emrys-Roberts, E., The late, 312 (Lab.)
Engman, M. F., with Cady, 548 (Ys.)
Enloe, 803 (Mal.)
Enlows, E. M. A., 747 (Dys.)
Epstein, H., 303 (Lab.), 702 (Rab.)
Erber, B., 843 (Z.)
Ernst, J. R., (553) (Ys.)
Escomel, E., 270 (Z.)
Esler, A. R., 549 (Ys.)
Essed, W. F. R., with Rodenwaldt, 804 (Mal.)
Etchegoin, E., with Bezancon, (718) (R.F.)
——, with Pettit, 186 (Jaun.)
Eubanas, F. C., with Lara, de Vera & Samson, 216 (Lap.)
Evans, A. M., (925) (Z.)
——, with Newstead & Potts, 80 (B.R.)
Evans, T. C., 364 (Dys.)
Ewing, H. E., 918 (Z.)
Eyckmans, R., 571 (Lep.)

F

Facio, A. A., 801 (Der.)
Fairley, N. H., 485 *ter*, 869 (Hel.)
——, & Liston, W. G., 485 (Hel.)
Fajardo, J., 579 (Lep.)
Falleroni, D., 903 (Z.)
Fantham, H. B., 835 *bis*, 843 (Z.)
Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923, 34 (Mal.), (383) (Pl.)
Faria e Maia, C. R. M. de, 640 (Misc.)
Farrer, E. M., 123 (Fev.), (383) (Pl.)
Farreras, P., 411 (Mal.)
Faust, E. C., 271, 273 (Z.), 334 (B.R.), 463, 455, 468, 871 (Hel.)
——, & Meleney, H. E., 468 (Hel.)
Faust, E. S., 84 (B.R.)
Felix, A., 464, 888 (Hel.)
Feng, C. T., with Miles, 977 (Misc.)
——, with Read, 854 (Lep.)
Ferguson, E. W., 299, 300, 918 (Z.), 789 (Lab.)
Fermi, C., 242, (252) (Rab.)
Fernandez, R., with Guerrero & Rosal, 550 (Ys.)
Fernando, A. S., 452 (Oph.)
Ferrari, A., 819 (Mal.)
Ferrell, 803 (Mal.)
Ficai, G., & Alessandrini, A., 511 *bis*, (515) (Und.)
Field, P. C., 762 (Sp.)
Figdor, P., 368 (Dys.)
Figueira, J., 681 (Misc.)
Fiji, Annual Medical Report, 907 (Z.)
Findlay, G. M., 102 (Bb.), 449 (Oph.)
Finzi, G., (252) (Rab.)
——, & Rondelli, A., (252) (Rab.)
Fischer, W., (540) (S.S.), 628 (Misc.)
Fitzgerald, R. D., 70 (Misc.)
Fitzpatrick, A. S., with Cameron, 874 (Hel.)
Flandin, C., 353 (Am.)
——, with Simon, Séguin & Lecoq, 842 (Z.)
Fletcher, T. B., Sen., S. K., Christophers, S. R. Andrews, E. A. Edwards, J. T., Richards, P. & Howard, A., 898 (Z.)
Fletcher, W., 816 (Mal.)
——, & Lesslar, J. E., 392 (nt.), 944 (Fev.)
——, with Stanton, 659, 662 (Misc.)
Flinn, F. B., 1006 (Misc.)
Florence, L., 301 (Z.)
Florentin, P., with de Lavergne, 714 (R.F.)
Floros, A., 411 (Mal.)
Flu, P. C., 84 (B.R.)
Foley, H. & Brouard, M., 822, (831) *bis* (Mal.)
——, with Cange, 447 (Oph.)
——, & Céard, L., 667 (Misc.)
——, with Sergent, Ed., & Sergent, Et., 826 (Mal.)

Foley, H., with Sergent, Ed., Parrot, & Catanei, 400 (Mal.)
——, with ——, ——, Sénévet & Catanei, 38 (Mal.)
Follweiler, F. L., & Haley, D. E., 995 (Misc.)
Foltz, P., with Businco, 43 (Mal.)
da Fonseca, O., 795 *bis* (Der.)
Fontaine, R., with Stulz, (505) (Hel.)
Fordyce, J. A., & Wise, F., 567 (Lep.)
Fornara, A., 232 (Der.), 438 (Tb.)
Forsius, R., 913 (Z.)
Forsyth, J. M., 675 (Misc.)
Forsyth, W. L., 153 (Misc.)
Fort, 803 (Mal.)
Foster, P., 200 (K.A.)
Fowler, H., 848, 852 (Lep.)
Fowler, J. K., 425 *bis* (Tb.)
Fraga, C., with Reis & Barreto, 643 (Misc.)
França, C., 283, 845 (Z.), 774 (Pl.)
Francesco, V., 656 (Misc.)
Franchini, G., 738 (Am.)
——, & Maggesi, B., 714 (R.F.)
Francis, E., 659 (Misc.)
Francois-Dainville, E., & Gallais, G., 828 (Mal.)
Frank, A., 932 (Sc.)
Fraser, A. R., 797 (Der.)
Fraser, F. R., with Ledingham, 658 (Misc.)
Frazier, C. N., & Wu, H., 861 (Lep.)
Freifeld, E. I., (413) (Mal.)
Freire, L. de C., 47 (Mal.)
French, G. R. W., & Sellards, A. W., 8 (Am.)
French, W. O., with Wyckoff, 863 (Hel.)
Fretz, H. E. K., 923 (Z.)
Frew & others, 555 (Syph.)
Fricker, J. M., 101 (Bb.)
Fricks, 41, 803 (Mal.)
Frison, T. H., 913 (Z.)
Fróes, J. A. G., with Noguchi, 188 (Y.F.)
Fronville, G., 325 (Misc.)
Fry, A. S., 5 (Am.)
Fujii, S., 388, 770 *bis* (Chl.), (757) (Dys.)
Fujinami, A., 374 (Pl.)
——, & Wu Lien Teh, (383) (Pl.)
Fujinami, H., with Uyehara & So, 104 (Bb.)
Fujita, K., (368) (Dys.)
Fukamachi, R., with Aoki, Kawamura, & Kamikawa, 853 (Lep.)
Fukui, S., 587 (Bb.)
Fukushima, H., 67 (Misc.), 98 (Bb.)
Fülleborn, F., 457, 484 (Hel.)
Fuller, C., 639 (Misc.)
Fulton, W. B., with McConnell & Yagloglou, 1004 (Misc.)
Funk, C., Collazo, J. A., & Kaczmarek, J., 585 (Bb.)
Furuichi, T., 830 (Mal.)
Furumori, K., 697 (K.A.)
Furutama, T., 367 (Dys.)

G

Gabriel, C., 411 (Mal.)
Gage, A. T., 812 (Mal.)
Gallagher, J. F., 887 (Hel.)
Gallais, G., with Francois-Dainville, 828 (Mal.)
Gallego, A., 245 (Rab.)
Galli-Valerio, B., 278 (Z.)
Galli-Valerio, G., 858 (Lep.)
Gallo, C., 697 (K.A.)
Galloway, D. J., 68, 70 (Misc.)
Galmozzi, F., 745 (Am.)
Ganguli, P., 686 (K.A.), 838 (Z.)
Garcia, F., & Guevara, R., 104 (Bb.)
Garcia de Quevedo, L., 643 (Misc.)
Gardner, G. H., Grove, R. C., Gustafson, R. K., Maire, E. D., Thompson, M. J., Wells, H. S., & Lamson, P. D., 665 (Misc.)
Garin, C., & Lépine, P., 345, 734 (Am.)
Garnier, M., 185 (Jaun.)
Garrett, F. D., 756 (Dys.)
Gasiorowski, N., & Meisel, H., 703 (Rab.)
Gautier, 725 (Y.F.)
Gavião Gonzaga, A., 927 (B.R.)
Gavino, C., & Tietze, S., 575 (Lep.)
Gedoelst, L., (505) (Hel.)
Geinitz, R., 492 (Hel.)
Gelli, G., 832 (Z.)
Geneeskundig Tijdschrift v. Nederlandsch-Indië, 322 *bis* (Lab.), 1002 (Misc.)
Genevray, J., 565 (Lep.)
Gentilucci, G., 490 (Hel.)
Gérard, F., 702 (Rab.)
Gerbasi, M., 118 (Und.)
Germond, 644 (Misc.)
Gerstenberger, H. J., Champion, W. M., & Smith, D. N., 109 (Sc.)
Gerstmann, J., (413) (Mal.)
Ghosh, N. L., 697 (K.A.)
Ghosh, R. H., (207) (K.A.)
Gibbs, C. S., 314 (Lab.)
Gilbert, M., with Bock, 783 (Lab.)
Gilbert, R., & Parsons, E. A., 311 (Lab.)
Gilks, J. L., 43 (Mal.), 554 (Syph.), 932 (Sc.)
Gill, C. A., 35 (Mal.)
Giordano, M., 123 (Fev.), (831) (Mal.)
Gioseffi, M., 745 (Am.), 807 (Mal.)
Girard, with Jousset, 973 (Misc.)
Girard, G., (383) (Pl.).
——, & Quimaud, J., 381 (Pl.)
Gislen, (553) (Ys.)

Gittings, F. C. B., (593) (Sc.)
Glaser, R. W., 289 *bis* (Z.)
Glasnik Ministrstva Narodnega Zdravja, Belgrade, 61 *bis* (Mal.)
Gobert & Conseil, (383) (Pl.)
——, with Nicolle, 376 (Pl.)
Goelam, 326 (Misc.)
Goheen, R. H. H., 491 (Hel.)
Goldberger, J., & Tanner, W. F., 542 (Pel.)
Gold Coast, Medical Research Institute, 318 (Lab.)
Gold Coast, 910 *bis* (Z.)
Goldschmidt, E., 487 (Hel.)
Golovanoff, M., 387 *bis* (Chl.)
Gomes, J. M., 671 (Misc.)
——, & de Assumpção, L., 154 (Misc.)
Gontier with Huot, 148 (Misc.)
Gonzalez, J. O., with d'Arnato, 737 (Am.)
Gonzalez, S., with Uriarte, 377 (Pl.)
Gonzâlez Rincones, R., 206 (K.A.)
Gonzalo, G. R., 828 (Mal.)
Goodey, T., 891 *bis* (Hel.)
Goodhue, W. J., & Hasseltine, H. E., 227 (Lep.)
Goodman, H., (241) (Der.)
Goodwin, E. St. G. S., 297 (Z.)
Gordon, A. H., 763 (Sp.)
Gordon, A. K., 303 (Lab.)
Gordon, R. M., 45, 406 (Mal.), 918 (Z.)
——, with Blacklock, 806 (Mal.)
——, with Stephens, 44 (Mal.)
Goré, S. N., 306, 308, 310 (Lab.)
Goresco, C., & Popesco, C., 62 (Mal.)
Gorman, P. J., with Hasseltine, 219 (Lep.)
Gorowitz-Wlassoff, L. M., 57 (Mal.)
Goto, M., with Wago, Suga & Suzuki, 752 (Dys.)
Goto, O., (383) (Pl.)
Gottschalk, C., 18 (Dys.)
Goudsmit, J., Hammer, E., & Wolff, J. W., 720 (Jaun.)
Gougerot & Le Coniat, 241 (Der.)
Goulay, M. A., (252) (Rab.)
Gouzien, P., 171 (R.F.)
Goyena, J. R., 829 (Mal.)
Graham, G. S., 669 (Misc.)
Graham, J. D. (384) (Pl.), 709 (R.F.), 851 (Lep.)
Gram, H. M., 850 (Lep.)
Grandy, C. R., 434 (Tb.)
Grant, A. R., & Silverston, J. D., 53 (Mal.)
Grassi, B., 40, 60, 397, 411 *bis*, 811 (Mal.), (925) *bis* (Z.)
Gratia, A., & Rhodes, B., 386 (Chl.)
Gravellat, with Abbatucci, 717 (R.F.)
Graybill, H. W., 479 (Hel.)
Graziadei, G., with Bozzolo, 839 (Z.)
Greeley, H. P., 122 (Fev.)
Greene, C. T., 913 (Z.)
Greenway, D., with Castex, 596 (B.R.), 833 *ter* (Z.)
Greer, A. E., 177 (R.F.)
Gregg, A. L., with Low, 819 (Mal.)
Gregg, A. L., 19 (Dys.)
Greig, E. D. W., 315 (Lab.)
——, & Kundu, S., 690 *bis*, 694 (K.A.)
Griffitts, T. H. D., 815 (Mal.)
Grönberg, A., 877 (Hel.)
Grootings, J. W., 157 (Misc.)
Gross, L., with Eggleton, 931 (Bb.)
Grossman, S., (831) (Mal.)
Grove, J. S., 885 (Hel.)
Grove, R. C., with Gardner, Gustafson, Maire, Thompson, Wells & Lamson, 665 (Misc.)
Grübel, E., 275 (Z.)
Gruber, G. B., & v. Haberer, H., 493 (Hel.)
Gruhzit, O. M., & Clark, L. T., 306 (Lab.)
Grünmandel, S., 878 (Hel.)
——, & Leichtentritt, B., 538 (S.S.)
Guazon, P. C., 973 (Misc.)
Gudger, E. W., 1004 (Misc.)
Gueidon, E., with Sergent, Et., 206 (K.A.)
Guénard, with Cassaët & Bonnin, 177 (R.F.)
Guérin, F. H., Lalung-Bonnaire & Nguyen-Van Khai, 441 (Tb.)
Guerrero, L., Fernandez, R., & Rosal, I., 550 (Ys.)
Guevara, R., with Garcia, 104 (Bb.)
Guggiari, P. B., & Crovato, G., 494 (Hel.)
Guillén, 850 (Lep.)
Guillerm, J., with Bernard, 102 (Bb.)
Guillet, 172, 708 (R.F.), 530 (S.S.)
——, with Mathis, 983 (Misc.)
Guimarães, A., 18 (Dys.)
Guiteras, Lebredo & Hoffmann, W. H., 183 (Jaun.)
Gujo, K., with Chuma, 860 (Lep.)
Gulland, G. L., 161 (Misc.)
Gully, P., (372) (Sp.)
Gunn, H., 333 (B.R.)
Gustafson, R. K., with Gardner, Grove, Maire, Thompson, Wells & Lamson, 665 (Misc.)
Gutierrez, P. D., 547 (Ys.)

H

v. Haberer, H., with Gruber, 493 (Hel.)
Haga, J., 474 (Hel.)
Haim, E., (505) (Hel.)
Haley, D. E., with Follweiler, 995 (Misc.)
Hall, G. A. M., 557 (Syph.)

Hall, J. H., & Reed, A. C., 744 (Am.)

Hall, J. S., with Cavanaugh & Dutcher, 933 (Sc.)

Hall, M. C., & Cram, E. B., 864, 866 (Hel.)

——, & Shillinger, J. E., 456, 866 (Hel.)

Hall, M. W., with Siler & Hitchens, 943 (Fev.)

Hammack, R. W., with Lovejoy, 794 (Der.)

Hammer, E., with Goudsmit & Wolff, 720 (Jaun.)

Hanington, J., 533 (S.S.)

Hanna. W., (384) (Pl.)

Hanschell, H. M., 60 (Mal.)

Hapke, F., 829 (Mal.)

Hara, C., 473 (Hel.)

Hara, K., with Tagawa & Ohmori, 587 (Bb.)

Hara, M., 365 (Dys.)

Hara, S., 593 (Sc.)

Hardikar, S. W., 75 (Misc.)

Harkness, A. H., 466 (Hel.)

Harmsen, E., 372 (Sp.)

Harper, P., 552 (Ys.)

Harris, H. A., with Houle, 827 (Mal.)

Harris, S., 542 (Pel.)

Harris, W. H., & Browne, D. C., 493 (Hel.)

——, & Duval, C. W., 516 (Fev.)

——, with Duval, 516 (Fev.)

Harrison, W. T., with Ransom & Couch, 488 (Hel.)

Harston, G. M., 951 (Oph.)

Hartman, E., with Payne & Ackert, 488 (Hel.)

Hartmann-Keppel, G. L., 489 (Hel.)

de Hartogh, Jr., J., 828 (Mal.)

Harvey, W. F., 783 (Lab.)

Hasegawa, K., with Watanabe, Nakamura, Kohno & Kawaguchi, 360 (Dys.)

Hasegawa, T., 886 (Hel.)

Hassall, A., with Stiles, 845 (Z.)

Hasseltine, H. E., with Goodhue, 227 (Lep.)

——, & Gorman, P. J., 219 (Lep.)

Hata, S., 242 (Rab.)

Hatai, K., 755 (Dys.)

——, with Suzuki & Tokuye, (386) (Dys.)

Hatori, J., 302 (Z.) 830 (Mal.)

Hauge, S. M., & Carrick, C. W., 934 (Sc.)

Haughwout, F. G., 26, 27, 362 (Dys.), 268 (Z.), 419 (B.R.)

Hausmann, T., 755 (Dys.)

Haworth, W. E., 281 (Z.)

Hayashi, T., with Aoki & Sakai, 718 (Fev.)

Hayes, C. A., & Oldt, F., 448 (Oph.)

Hayne, 803 (Mal.)

Hayne, T. B., with Barber & Komp, (924) (Z.)

Head, G. D., 541 (Pel.)

Heggs, T. B., (391) (Chl.)

Hegner, R. W., 268, 277, 834, 838, 839 *bis*, 898 (Z.), 803 (Mal.)

Heimburger, L. F., 346 (Am.)

Heinemann, H., 226 (Lep.), 368 (Dys.), 577 (Lep.)

Heiser, V. G., 856 (Lep.)

Hendriks, J. A., 36 (Mal.)

Henry, T. A., with Brown & Duncan, 307 (Lab.)

Hermans, A. G. J., 876 (Hel.)

Herms, W. B., 912 (Z.)

Heron, G. W., 38, 804 (Mal.)

Herre, A. W. C. T., 924 (Z.)

Herrick, A. B., with Runyan, 732 (Am.)

Herrmann, G., (413), 824 (Mal.)

Herrmann, O., 699, 701 *bis*, 702, 705, 706 (Rab.)

Hertslet, L. E., 636 (Misc.)

Hesse, E., 710 (R.F.)

Heymann, 972 (Misc.)

Heymann, P., 4 (Am.)

Higier, H., 830 (Mal.)

Hille, G., with Prausnitz, 391 (Chl.)

Hines, L. E., 63 (Mal.), 364 (Dys.)

Hiraishi, T., with Toguchi, Okamoto, Ohta & Kwa, 587 (Bb.)

Hirakawa, H., with Satomi, 391 (Chl.)

——, with —— & Miura, 706 (Rab.)

Hirst, L. F., (392) (Ent.), 913 (Z.)

Hirst, S., 918 (Z.)

Hitchens, A. P., with Siler & Hall, 943 (Fev.)

Hiyeda, K., 185 (Jaun.)

Hoagland, R., & Lee, A. R., 103 (Bb.)

Hoder, F., 358 (Dys.)

Hodson, V. S., 351 (Am.), 400, 401 (Mal.)

Hoeltzer, R., with Aristowsky, 712 (Rab.)

Hoffman, F. L., 214 (Lep.), 623 (Misc.)

Hoffman, K., with Schilling, Jossmann, Rubitschung & van der Spek, 412 (Mal.)

Hoffmann, W. H., 79 (Misc.), 189 *quin*, 725, 726 (Y.F.), 713 (R.F.)

——, with Guiteras & Lebredo, 183 (Jaun.)

Hofmann, J. A., 584 (Bb.)

Hogg, C. A., 72 (Misc.)

Holderman, H. H., 216 (Lep.)

Holland, E. P., & Woodward, E. A., 465 (Hel.)

Holland, H. T., 668 (Misc.)

Holm, K., 46 (Mal.)

Holt, R. L., & Reynolds, F. H. K., 936 (Una.)

Hone, F. S., 520 (Fev.)

Hongo, G., 877 (Hel.)

Honig, P. J. J., with Swellengrebel, 809 (Mal.)
Honna, F., 68 (Misc.)
Hood, A., 772 (Pl.)
van Hoof, L., 540 (S.S.), 625 (Misc.)
——, with van den Branden, 135 (S.S.), 319 (Lab.)
Hoops, A. L., 808 (Mal.)
Hopkins, F. G., 164 (Misc.)
Hopkins, G. H. E., 889 (Hel.)
——, with Buxton, (924) (Z.)
Horn, A. E., 622 (Misc.)
Horn, L., & Kauders, O., 56 (Mal.)
Horowitz-Wlassowa, L., 407 (Mal.)
Horwitz, P., with Tucker, 566 (Lep.)
Hosoda, N., with Kozawa & Hosoda, 930 (Bb.)
Hosota, N., with —— & Kusunoki, 587 (Bb.)
Houghton, J. E., with Butler & Cooper, 233, (802) (Der.)
Houle, E. C., & Harris, H. A., 827 (Mal.)
Houssiau, 239 (Der.), 367 (Dys.)
Howard, A., with Anderson & Simonsen, 985 (Misc.)
——, with Fletcher, Sen, Christophers, Andrews, Edwards & Richards, 898 (Z.)
Howard, S. C., 34 (Mal.)
Howe, P. R., with Wolbach, 935 (Sc.), 947 (Oph.)
Hubbard, L. D., with Lewis & Dyar, (413) (Mal.)
Hudelo & Kourilsky, R., 572 (Lep.)
Hudelo & Pierrot, 216 (Lep.)
Hudson, B., Morland, A. J., & Zimmerli, E., (718) (R.F.)
Huebschmann, P., 746 (Dys.)
Hughes, T. A., 311 (Lab.)
——, with Sinton, 399 (Mal.)
Hulk, J. F., with Woltring, 197 (K.A.)
Hunter, R. N., 771 (Pl.)
Hunter, W., 371 (Dys.)
Huot & Gontier, 148 (Misc.)
Huppenbauer, C., 353 (Am.)
Hussain, M., with Ross, 277 (Z.)
Hutchinson, C. M., 917 (Z.)
Huyssen, C. W., & Buendia, R., (413) (Mal.)

I

Iacono, I., (368) (Am.)
Idrac, with Mouriquand, Leulier, & Michel, 935 (Sc.)
Iglesias, M. S., 383 (Pl.)
Iimura, Y., (391) *bis* (Chl.)
Ijiri, M., 105, 587 (Bb.)
Ikeda, T., 106, 107 (Bb.)
Iles, M., with Davey, McNaughton & Moole, 558 (Syph.)
Imamura, A., & Ando, 242 (Rab.)
——, with Nagayo, Miyagawa, Mitamura, Tamiya & Sato, 122 (Fev.)
Indian Journal of Medical Research, 479 (Hel.)
Indian Med. Gaz., 898 (Z.)
Ingram, A., 318 (Lab.), 464 (Hel.)
——, & Macfie, J. W. S., 302 (Z.)
Ingram-Johnson, R. E., 810 (Mal.)
Innes, F. R., 688 (K.A.)
Ioff, I., 394 (Mal.)
——, with Kitaew, 273 (Z.)
Ionesco, D., 706 (Rab.)
Ionesco, V., with Calalb, 748 (Dys.
Ipatjewa, A., 829 *bis* (Mal.)
Irvine, A. C., 149 (Misc.), 912 (Z.)
Isobe, 877 (Hel.)
Ito, H., 587, 931 *bis* (Bb.)
Ito, M., 541, 542 (Pel.)
Ito, T., with Takagi, Tamaki & Murata, 897 (Hel.)
Iturbe, J., 467 *bis* (Hel.)
Iwabuchi, T., 111 (Sc.)
Iwahashi, U., 864 (Hel.)
Iwanow, E., 842 (Z.)
Iyengar, M. O. T., 286 (Z.)
Izar, G., 691 (K.A.), 735 (Am.)
Izkowitsch, (831) (Mal.)

J

Jachontow, J. E., 827 (Mal.)
Jackson, O. E., (418) (Bl.)
Jacob, E., 301 (Z.)
Jacobi, E., 364 (Dys.)
Jacobs, W. A., 273 (Z.)
Jacono, I., 13 (Am.), 578 (Lep.)
Jagdschan, 47 (Mal.)
Jagić, N., & Spengler, G., 825 (Mal.)
Jakimov [Yakimoff], V. L., 717 (R.F.)
Jame, L., 669 (Misc.)
James, J. F., 796 (Der.)
James, W. M., 395 (Mal.)
——, & Deeks, W. E., 343 (Am.)
Jamin, H., 801 (Der.), 982 (Misc.)
——, with Burnet, Broc & Brun, 236 (Der.)
Jamison, S. C., with Johns, 740, 741 (Am.)
Jamot, with Tanon, (540) (S.S.)
——, with Letonturier & de Marqueissac, 138, 524 (S.S.)
——, with ——, & Tanon, 524 (S.S.)
Jamot, E., with Tanon, 132, 136, 540 (540) (S.S.)
Jansen, B. C. P., & Donath, W. F., 64, 65 (Diet.)
Japha, A., 491 (Hel.)
Jason, J. M., 848 (Lep.)
Jeanselme, E., & Bloch, M., 483 (Hel.)
Jemma, R., 195 (K.A.)

Jessner, M., 241 (Der.)
——, & Amster, S., 686 (K.A.)
Jettmar, H. M., 917 (Z.)
Jeunhomme, P., 242 (Rab.)
Jewell, N. P., 238 (Der.), 990 (Misc.)
Jimenez, J., (384) (Pl.)
Joannidès, G. S., (384) (Pl.)
Jobling, B., 297 (Z.)
John, E., 174 (R.F.)
Johns, F. M., 798 (Der.)
——, & Jamison, S. C., 740, 741 (Am.)
Johnson, G. L., 952 (Oph.)
Johnson, W. B., with Lloyd, 530 *bis* (S.S.)
——, with ——, Young & Morrison, 290 (Z.)
Jones, I. D., 30 (Sp.)
Jones, J. L., & Brown, H. C., 399 (Mal.)
Jones, W E., & Butler, H. W., 50 (Mal.)
Jonesco, D., & Popper, M., 812 (Mal.)
de Jong, D. A., 845 (Z.)
Jordan, K., 916 (Z.)
Jorge, R., (384) (Pl.)
Jossmann, with Schilling, 417 (Bl.)
——, with ——, Hoffmann, Rubitschung & van der Spek, 412 (Mal.)
Journal of the Philippine Islands Medical Association (392) (Ent.)
Jousset & Girard, 973 (Misc.)
Joyeux, C., 456, 862 *quat.*, 877 (Hel.), 844 (Z.), 971 (Misc.)
——, with Brumpt, 996 (Misc.)
Junès, E., & Buckwell, P., 240 (Der.)

K

Kachi, Y., 723 (Jaun.)
Kaczmarek, J., with Funk & Collazo, 585 (Bb.)
Kadaner, M., 638, 646 (Misc.)
Kagoshima, S., with Ogata, Kawakita & Suzuki, 106 *bis* (Bb.)
Kalberlah, F., 169 (R.F.)
Kamada, R., 479 (Hel.)
Kamei, K., 171 (R.F.)
Kameyama, S., 504 (Hel.)
Kamikawa, Y., with Aoki, Kawamura & Fukamachi, 853 (Lep.)
Kamiza, R., 106 (Bb.)
Kanagarayer, K., with Kingsbury, 783 (Lab.)
——, with Stanton, 659 (Misc.)
Kanai, S., 24 (Dys.)
Kandelaki, S., 238 (Der.)
Kaneko, S., with Tagawa, 104 (Bb.)
Kapadia, R. J., with Stevenson, 776 (Pl.)
Kapur, N. C., 690 (K.A.)
Karlowski, Z., 699 (Rab.)
Karsenty, A., 775 (Pl.)
Kasai, K., 360 (Dys.)
Kasuga, K., 204 (K.A.)
Katata, B., 475 (Hel.)
Kato, G., 103 (Bb.)
Katsunuma, S., (925) (Z.)
Kauders, O., with Barzilai-Vivaldi, 56, 408 (Mal.)
——, with Horn, 56 (Mal.)
Kawaguchi, I., with Watanabe, Hasegawa, Nakamura & Kohno, 360 (Dys.)
Kawakita, S., with Ogata, Suzuki & Kagoshima, 106 *bis* (Bb.)
Kawamura, H., & Tsuchiya, K., 360 (Dys.)
Kawamura, K., with Aoki, Kamikawa, & Fukamachi, 853 (Lep.)
Käyser, J. D., 791 (Der.)
Kehl, R., 492 (Hel.)
Keilin, D., 294 (Z.)
Kelaart, H. van G., 205 (K.A.)
Kellaway, C. H., 872 (Hel.)
——, with Bryce & Williams, 481 (Hel.)
——, with Dew & Williams, 873 (Hel.)
Kennedy, A. M., 507 (B.R.)
Kennedy, J. C., 798 (Der.)
Kenya Medical Journal, 173 (R.F.)
Kepinow, L., 388 (Chl.)
Kepler, E. J., 929 (Bb.)
Keppler, A., 576 (Lep.)
Kerr, I., 852 (Lep.)
Keruzoré, A., with Blanchard, 827 (Mal.)
Kervrann, 796 (Der.)
Kessel, J. F., 13 *bis* (Am.), 333 *ter*, 334 (B.R.), 756 (Dys.), 836, 838, 844 (Z.)
——, with Kofoid, & Swezy, 13 (Am.), 275 (Z.), 333, 334 (B.R.)
——, & Svensson, R., 334 (B.R.), 832 (Z.)
Kessler, A., with Nocht, 416 (Bl.)
Keukenschrijver, N. C., with Walch, 122 (Fev.), 300 (Z.)
Khalil, M., 454, 455 *bis*, 461 *bis*, 502, 504 (Hel.)
Khaw, O. K., 872 (Hel.)
Khera, K. L., 828 (Mal.)
Khouri, J., 674 (Misc.)
Kidston, T. A., 61 (Mal.)
King, 41, 803 (Mal.)
King, G. E., 962 (Misc.)
King, H. H., 150, 648 (Misc.)
Kingsbury, A. N., & Kanagarayer, K., 783 (Lab.)
Kirby, G. H., with Bunker, 409 (Mal.)
Kirkpatrick, H., 446, 947, 951 (Oph.)
Kirschner, L., 250 *bis* (Rab.)
——, & van Loon, F. H., 54 *bis* (Mal.)
——, with ——, 54 (Mal.)
Kitaew, F., & Ioff, I., 273 (Z.)
Kitayama K., with Koshina & Shiwozawa, 176 *bis* (R.F.)

Kits van Heijningen, A., 576 (Lep.)
Kligler, I. J., 59 (Mal.), 286 (Z.), 805 (Mal.)
——, Shapiro, J. M., & Weitzman, I., 394 (Mal.)
——, & Theodor, O., 900 (Z.)
Klinov, V., with Shukevich, (384) (Pl.)
Klüchin, S., & Vigodtschkoff, G., 769 *bis* (Chl.)
Kluge, O., 412 (Mal.)
Knipping, H. W., 74 (Misc.)
Knowles, R., with Acton, 1 (Am.) 25 (Dys),
——, & Das Gupta, B. M., 194, 195 (K.A.), 332 (Misc.)
——, Napier, L. E., & Smith, R. O. A., 193 (K.A.)
Kobayashi, H., 453 (Hel.)
Kobayashi, M., 491 (Hel.)
Kobayashi, W., 219 (Lep.)
Kobayashi, Y., 105 *ter*, 587 (Bb.)
Koch, R., 133 (S.S.)
Kofoid, C. A., 835, 836 (Z.)
——, Boyers, L. M., & Swezy, O., 733 (Am.)
——, & Swezy, O., 333, 334 *ter* (B.R.), 837, (925) (Z.)
——, ——, & Kessel, J. F., 13 (Am.), 275 (Z.), 333, 334 (B.R.)
Kohno, Y., with Watanabe, Hasegawa, Nakamura & Kawaguchi, 360 (Dys.)
Kohshina, Y., 723 (Jaun.)
Kojima, K., 359 *bis* (Dys.)
Kolle, W., 540 (S.S.)
——, Schlossberger, H., & Prigge, R., 23 (Dys.)
Komp, W. H. W., with Barber, 405 (Mal.)
——, with —— & Clark, 820 (Mal.)
——, with —— & Hayne, (924) (Z.)
Kondo, K., 474 (Hel.)
Kondo, S., 23 (Dys.), (252) (Rab.), 859 (Lep.)
——, & Nodake, R., 859 (Lep.)
Kondo, Y., 106 (Bb.)
Koose, W., 358 (Dys.)
Kop, W. A., 8 (Am.)
Kopke, A., 531 (S.S.)
Koritschoner, R., & Schweinburg, F., 699 (Rab.)
Körner, 719 (Jaun.)
Korobkova, E., 1006 (Misc.)
——, & Sherishorina, S., 301 (Z.)
de Korte, W. E., 114 (Und.)
Korteweg, P. C., 45, 54, 818 *bis* (Mal.)
Koshina, Y., Shiwozawa, S., & Kitayama, K., 176 *bis* (R.F.)
Kostitch, D., 950 (Oph.)
Kosuge, J., 777 (Pl.)
Kourilsky, R., with Hudelo, 572 (Lep.)
Kouwenaar, W., (718) (R.F.)
Kozawa, S., Kusunoki, M., & Hosota, N., 587, 930 (Bb.)
Krantz, W., 712 (R.F.)
Kraus, R., 250, 703, 704 (Rab.)
Krause, A., 356 (Dys.)
Krause, P., 84 (B.R.)
Kreitmair, H., 460 (Hel.)
Krijgsman, B. J., with Nieschulz, 839 (Z.)
Krishnan, K. V., with Cunningham & Theodore, 14, 753 (Dys.)
von Krogh, M., 346 (Am.)
Krueger, A. P., with Proescher, 304 (Lab.)
Kruglak, E., with Rosentul, 858 (Lep.)
Kudicke, R., Strauss, E., & Collier, W. A., 146 (S.S.)
Kudo, R., 302 (Z.)
Kudrjawzewa, A., with Palladin & Normark, 934 (Sc.)
Kuhn, P., with Uhlenhuth & Schmidt, 141 (S.S.)
Kulesha, G. S., 375 *bis* (Pl.)
Kundu, S., with Greig, 690 *bis*, 694 (K.A.)
Kuno, Y., 35 (Mal.)
Kuroda, T., 721 (Jaun.)
Kusama, H., 749 (Dys.)
——, with Schöbl, 229 (Lep.)
Kuschew, N. E., (413) (Mal.)
Kusunoki, M., with Kozawa & Hosota, 587, 930 (Bb.)
Kwa, F., with Toguchi, Okamoto, Hiraishi & Ohta, 587 (Bb.)
Kyrle, J., 56 (Mal.)

L

Labbé, M., & Denoyelle, L., 883 (Hel.)
Lacapère, with Laurent, C., 254 (B.R.)
Lacroix, A., 447 (Oph.)
——, with Montpellier, 880 (Hel.)
de Laet, 830 (Mal.)
Lagoanère, J. L., with Burnet, 117 (Und.)
Laidlaw, P. P., 782 (Lab.)
Laignel-Lavastine, 580 (Lep.)
Laigret, J., with Blanchard, 130 (S.S.)
Lal, R. B., with Sinton, 44 (Mal.)
Lallamant, M. A., 894 (Hel.)
Lalung-Bonnaire & Bablet, J., 971 (Misc.)
——, with Guérin & Nguyen-Van Khai, 441 (Tb.)
——, Motais fils & Pons, 67 (Misc.)
Lambling, A., with Paisseau, 441 (Tb.)
Lamborn, W. A., 291, 899 (Z.)
Lamson, P. D., with Gardner, Grove, Gustafson, Maire & Thompson, 665 (Misc.)
Lamy, A., with Emile-Weil, 12 (Am.)

Landeman, E., with Muir, De, Roy & Santra, 223 (Lep.)
Lane, C., 479, 495 (Hel.), 812 (Mal.)
Lane, W. A., 627 (Misc.)
Lanford, J. A., & Lawson, E. H., 718 (Fev.)
——, & Warner, C. M., 912 (Z.)
de Langen, C. D., 68 (Misc.)
——, & Roskott, E. R. A. L., 821 (Mal.)
Langer, J., 61 (Mal.)
Langeron, J., 644 (Misc.)
Langeron, L., with Arloing, 117 (Und.)
Lanzarini, F., 543 (Pel.)
Lapie, G., 913 (Z.)
Lapin, M. O., 799 *bis* (Der.)
Lapponi, D., 246 (Rab.)
Lara, C. B., de Vera, B., Samson, J. G., & Eubanas, F. C., 216 (Lep.)
——, with Wade & Nicolas, 574 (Lep.)
Larregla, S., 812 (Mal.)
Larrousse, F., 298, 918 (Z.)
——, with Ribadeau-Dumas, 912 (Z.)
Larson, W. P., & Sedgewick, J. P., 115 *bis* (Und.)
Lasnet, 296 (Z.) 440 (Tb.), 524 (S.S.)
Laurent, C., with Lacapère, 254 (B.R.)
de Lavergne, V., 39 (Mal.)
——, & Florentin, P., 714 (R.F.)
——, & Perrier, P., 720 (Jaun.)
Lavier, G., 839 (Z.)
Lawson, A., 451 (Oph.)
——, with Russ, 954 (Oph.)
Lawson, E. H., with Lanford, 718 (Fev.)
Leach, C. N., 457 (Hel.)
League of Nations, (784 *bis*) (Lab.)
Leão, A. E. de A., 221 (Lep.)
——, with Torres, 205 (K.A.)
Lear, M., & Merrill, E. S., 5 (Am.)
Lebailly, C., with Nicolle, 976 (Misc.)
Le Bas, G. Z. L., 475 (Hel.)
Leblanc, L., 698 (K.A.)
Le Bourdelles, A. C. B., with Pigeon, 655 (Misc.)
Lebredo, with Guiteras & Hoffmann, 183 (Jaun.)
Lécaillon, & Audigé, 917 (Z.)
Le Chuiton, F., 988 (Misc.)
Le Coniat, with Gougerot, 241 (Der.)
Lecoq, with Simon, Flandin, & Séquin, 842 (Z.)
Le Dantec, A., 410 (Mal.)
Ledingham, J. C. G., & Fraser, F. R., 658 (Misc.)
Lee, A. R., with Hoagland, 103 (Bb.)
Lee, C. U., 870 (Hel.)
Lee, T. P., 451 (Oph.)
Lefèvre, R., 396 (Mal.), 639 (Misc.), 871 (Hel.)
Lefort, 447 (Oph.)
Lefrou, G., 355 (Dys.)
——, with Blanchard, 527 (S.S.)
Legendre, J., 286, 302 (Z.), 410, 822 (Mal.)
Leger, M., 383 (Pl.), 715 (R.F.)
Leichtentritt, B., with Grünmandel, 538 (S.S.)
Leiper, R. T., 85 (Hel.)
Leiva, L., with Sellards, 9 (Am.)
Lejeune, E., 540 (S.S.)
Lellis, A., 61 (Mal.)
Lemaire, G., 116 (Und.)
Lemierre, A., Leon-Kindberg, M., & Bernard, E., 688 (K.A.)
Lenert, 803 (Mal.)
Le Noir, P., & Deschiens, R., 272 (Z.) 365 (Dys.)
Lenz, W., 639 (Misc.)
Leon, N., 288 (Z.), 878 (Hel.)
de Leon, W., with Sison, A. G., Sison, A. B. M., 980 (Misc.)
Leon-Kindberg, M., with Lemierre & Bernard, 688 (K.A.)
Lepine, P., (925) (Z.)
——, with Garin, 345, 734 (Am.)
Lepper, E. H., & Zilva, S. S., 935 (Sc.)
Le Prince, 41, 803 (Mal.)
Le Roy des Barres, A., 491 (Hel.)
Lesbre, P., & Verdeau, A., 24, 357 (Dys.)
Lesslar, J. E., with Fletcher, 392 (Ent.), 944 (Fev.)
Letonturier, de Marqueissac & Jamot, 138, 524 (S.S.)
——, Tanon & Jamot, 524 (S.S.)
Leulier, A., with Mouriquand & Michel, 590, 591 *bis* (Sc.)
——, with ——, ——, Idrac, 935 (Sc.)
Leupold, F., 535 (S.S.)
Levaditi, C., & Nicolau, S., 640 (Misc.)
——, ——, Salgue, J., & Schoen, R., 557 (Syph.)
——, ——, & Schoen, P., 243 (Rab.)
Levin, J. J., & Porter, A., 489 (Hel.)
Levy, D. M., 578 (Lep.)
——, with Muchow, 221 (Lep.)
Lévy, P. P., 198 (K.A.)
Lewis, N. D. C., Hubbard, L. D., & Dyar, E. G., (413) (Mal.)
Lewis, P. A., 278 (Z.)
Ley, A., 56 (Mal.)
Lhuerre, H., 640 (Misc.)
Li, K. H., 37 (Mal.)
Libanio, S., with Dias & Lisbôa, 922 (Z.)
Lichtenstein, A., 679, 981 (Misc.)
——, & van Steenis, P. B., 18 (Dys.)
Lilly, G. A., 823 (Mal.)
Lima, A. B., 847 (Lep.)
Lin, C. S., 706 (Rab.)
Lind, J. E., with Eldridge, Silk & Trentzsch, 824 (Mal.)

Lindenberg, A., with Noguchi, 692 (K.A.)
Ling, W. P., 451 (Oph.)
Lins, A., 28 (Dys.)
Liotard, with d'Oelsnitz, Daumas & Puech, 687 (K.A.)
Liotta, D., 933 (Sc.)
Lippmann, W., 450 (Oph.)
Lisbôa, M., with Dias & Libanio, 922 (Z.)
Liston, W. G., with Fairley, 485 (Hel.)
Little, C. J. H., with Sinton, 904 (Z.)
Little, E. M., & Ross, M. J., 15 (Dys.)
Ljachowczki, A. M., 62 (Mal.)
Lloyd, L., 277 (Z.)
——, & Johnson, W. B., 530 *bis* (S.S.)
——, ——, Young, W. A., & Morrison, H., 290 (Z.)
Loevenbruck, L., 673 (Misc.)
van Loghem, J. J., 389 (Chl.)
Lombardi, A., 50 (Mal.)
London School of Hygiene & Tropical Medicine, 996 (Misc.)
van Loon, F. H., 70, 326 (Misc.)
——, & Kirschner, L., 54 (Mal.)
——, with ——, 54 *bis* (Mal.)
Lopatine, G. M. (831) (Mal.)
Lopez, C., with Domingo, 514 (Und.)
Lorentz, F. H., 492 (Hel.)
Lotsy, G. O., 472 (Hel.)
Lovejoy, E. D., & Hammack, R. W., 794 (Der.)
Low, G. C., (146) (S.S.), 879 (Hel.)
——, & Cooke, W. E., 483 (Hel.)
——, & Gregg, A. L., 819 (Mal.)
Lüdke, H., 356 (Dys.)
Ludlow, A. I., 472 (Hel.)
Luengo, E., 534 (S.S.)
——, Aznar, P., & de Buen, S., 635 (Misc.)
——, & de Buen, S., 137 (S.S.)
——, with ——, 393 (Mal.)
Luis Nicolini, H. J., 155 (Misc.)
Lukowa, A. I., (413) (Mal.)
Lussich-Maktovitch, 949 (Oph.)
Luzzatti, T., 492 *bis* (Hel.)
Lwoff, A., 694 (K.A.), 744 (Am.)
Lynch, K. M., 301 (Z.)
Lyon, B. M., with Eichhorn, (252) (Rab.)
Lyon, D. M., 719 (Jaun.)

M

McAlister, W. M. (831) (Mal.)
MacArthur, W. P., 341 (B.R.)
MacBride, H. J., & Templeton, W. L., 52, (413) (Mal.)
MacCallan, A. F., 451, 952 (Oph.)
McCarrison, R., & Norris, R. V., 594 (B.R.)
M'Cluskie, J. A. W., with Adams & Blacklock, 716 *bis* (R.F.)
McConnell, W. J., & Yagloglou, C. P., assisted by Fulton, W. B., 1004 (Misc.)
MacCormac, H., (861) (Lep.)
MacCormick, D. D., 126 (Fev.)
McCracken, J. C., 75 (Misc.)
Macfie, J. W. S., with Ingram, 302 (Z.)
——, with Yorke, 50 *bis* (Mal.)
McGlannan, A., 737 (Am.)
McGowan, P. K., 542 (Pel.)
McGrath, M. J., with Bolton, 361 (Dys.)
McGrath, W. M., (413) (Mal.)
MacGregor, M. E., 280 *bis*, (925) (Z.)
Maciel, H., 896 (Hel.)
McIntosh, R. D., with Cilento & Charlton, 320 (Lab.)
McKean, J., 565 (Lep.)
McKendrick, A. G., 699 (Rab.)
McKenzie, A., 549 (Ys.)
Mackenzie, I., 412 (Mal.)
Mackie, A. S., 161 (Misc.)
Mackie, F. P., 315 (Lab.), 379, 381 (Pl.), 898 (Z.)
——, with Avari, 204 (K.A.)
MacKinnon, M., 631 (Misc.)
Macklin, A. H., 592 (Sc.)
McLeod, G., Crofts, E. E., & Benedict, F. G., 1005 (Misc.)
MacLeod, J. M. H., 567 (Lep.)
McMullen, J., 447 (Oph.)
McNaughton, J. G., 556 (Syph.)
——, with Davey, Iles & Moole, 558 (Syph.)
Macphail, J. M., 951 (Oph.)
Macphail, N. P., 401 (Mal.)
MacPherson, J., (925) (Z.)
MacRae, D. M., 64 (Diet.)
McRae, J. C., 797 (Der.)
McRobert, G. R., 816 (Mal.)
Macvicar, N., 972 (Misc.)
Madras, 788 (Lab.), 954 (Oph.)
Maekawa, H., 871 (Hel.)
de Magalhães, O., 920, 923 (Z.)
Maggesi, B., with Franchini, 714 (R.F.)
Maggiore, S., 44 (Mal.), 686 (K.A.)
Maire, E. D., with Gardner, Grove, Gustafson, Thompson, Wells & Lamson, 665 (Misc.)
Mairlot, with Portois & Tilsley, (553) (Ys.)
Maitra, G. C., 765 (Chl.)
Maitra, J., 685 (K.A.)
Maitra, J. N., 884 (Hel.)
Maity, B. B., with Brahmachari, 689 (K.A.)
Makalintal, A. J., (392) (Ent.)
Malariacommissie voor Noordholland, 818 (Mal.)
Malchi, A., 866 (Hel.)
Malcomson, J. E., 853 (Lep.)

Mallardi, M., 697 (K.A.)
Malone, R. H., 150 (S.S.), 648 (Misc.)
Manalang, C., 499, 501 (Hel.), 768 (Chl.)
Mandoul, A. H., with Verdun, 167 (B.R.)
Mandru, V., (413) (Mal.)
Mann, W. L., 157 (Misc.)
Manson-Bahr, P. H., 19 (Dys.), 259 (Am.), 506 (B.R.)
Manteufel, P., (179) (R.F.), 383 (Pl.)
Maplestone, P. A., 269 (Z.)
Marcenac, 923 (Z.)
Marchoux, E., 209, 213 (Lep.), 363 (Dys.), 404, 816 (Mal.), 902 (Z.)
——, & Cohen, 404 (Mal.)
Mariani, G., 206 (K.A.), 222 (Lep.)
Marie, A. C., 700 (Rab.)
Marie, S. U., & Raleigh, J. T., 305 (Lab.)
Marjoribanks & O'Driscoll, 67 (Misc.)
de Marqueissac, with Letonturier & Jamot, 138, 524 (S.S.)
Marseew, 173 (R.F.)
Marshall, C. H., & Ram, A., 378 (Pl.)
Martin & Dekester, 214 (Lep.)
Martin, A., 948 (Oph.)
Martin, C. de C., 922 (Z.)
Martin, C. J., with Bacot, 295 (Z.)
Martini, E., 43 (Mal.), 901 (Z.)
Martins, H., with Noguchi, Muller, Torres, Silva, Ribeiro Dos Santos, Vianna & Biao, 188, (726) (Y.F.)
Maruyama, Y., 777 *bis* (Pl.)
Marx, A. M., 247 (Rab.)
——, with Schultz, 330 (Misc.)
Marziani, L., 493 (Hel.)
Marzinowsky, E. I., & Schurenkowa, A., 206 (K.A.)
Mascarenhas, C. J., with Welch, 20 (Dys.)
Maslova, A. N., 62 (Mal.)
Massias, C., 107 (Bb.)
Masson, C. B., 410 (Mal.)
Mastier, with Sédan, 448 (Oph.)
Matheson, H. F., with Armstrong, 324 (Misc.)
Mathis, C., 443 (Tb.)
——, & Guillet, 983 (Misc.)
Matignon, J. J., 323 (Misc.)
Matsumoto, S., 587 (Bb.)
Matsuo, T., 391 (Chl.)
di Mattei, E., 381, 775, 776 (Pl.)
Mattlet, G., 550 (Ys.), 671 (Misc.)
Mauritius, 788 (Lab.)
Maxcy, K. F., 41 (413), 803 (Mal.)
——, with Sinclair, 656 (Misc.)
Maxwell, C. N., 825 (Mal.)
Maxwell, J. L., 156 (Misc.)
Maxwell, J. P. & Miles, L. M., 978 (Misc.)
Mayer, M., 84 (B.R.)
Mayne, with Barber, 41 (Mal.)
Mazzolenis, U., with Tedesco, 579 (Lep.)
Medina Jiménez, R., 42 (Mal.)
Megaw, J. W. D., 98 (Bb.), 518 (Fev.), 614 (Misc.)
——, Shettle, F. B., & Roy, D. N., 518 (Fev.)
Mehemmed, K., 63 (Mal.)
Mehta, B. N., 181 (Fev.)
Meireles, J. E. Q., 443 (Tb.)
Meisel, H., with Gasiorowski, 703 (Rab.)
Meleney, H. E., 470 (Hel.), 683 *bis* (K.A.), 986 (Misc.)
——, with Faust, 468 (Hel.)
de Mello, F., 301 (Z.), 347 (Am.), 705 (Rab.), 715, (718) (R.F.)
——, d'Almeida, C., & Rebello, F., 716 (R.F.)
——, & Brás de Sá, 124, 945 (Fev.)
——, —— & Colopo, G., (520), 945, 946 (Fev.)
——, Costa, A. R., Paes, S., & Rebello, F., 636 (Misc.)
——, & Mesquita, B. P., 713 *bis* (R.F.)
——, & Paes, S., 792 (Der.)
——, Pinto, J. F., Rebello, F., & Paes, S., 698 (K.A.)
——, Rebello, F., & Paes, S., 698 (K.A.)
——, & da Silva, F. V., 278 (Z.)
Melnik, M., 750 (Dys.), 769 (Chl.)
Melnotte, P., 668 (Misc.)
——, with Dekester, 206 (K.A.)
Mendelson, R. W., 231 (Der.)
——, & Ellis, A. G., 147 (Misc.)
Mengert-Presser, H., 872 (Hel.)
Mense, C., 84, 338 (B.R.)
Mense, K., junior, with Plehn, 84 (B.R.)
Mercier, L., 907 (Z.)
Merrill, E. S., with Lear, 5 (Am.)
Mesquita, B. P., with de Mello, 713 *bis* (R.F.)
Mhaskar, K. S., 496 (Hel.)
Michalka, 242 (Rab.)
Michel, P., with Mouriquand & Berheim, 112 (Sc.)
——, with —— & Leulier, 590, 591 *bis* (Sc.)
——, with ——, ——, Idrac, 935 (Sc.)
——, with —— & Rochaix, 110, 111 (Sc.)
Miguens, J., 550 (Ys.)
Miles, L. M., & Feng, C-T., 977 (Misc.)
——, with Maxwell, 978 (Misc.)
Miller, D. W., with Dyer & Voegtlin, 142 (S.S.)
Miller, G. A., with Yakimoff, 844, (925) (Z.)
Millous, P., & Dong-Ngoc-Dieu, 950 (Oph.)
Mills, R. G., 917 (Z.)

Minervin, S., 385 (Chl.)
Ministry of Health, 881 (Hel.)
Minkewitsch, S., 124 (Fev.)
Mironesco, T., (718) (R.F.)
Missiroli, A., (925) (Z.)
Mitamura, T., with Nagayo, Miyagawa Imamura, Tamiya & Sato, 122 (Fev.)
Mitchell, A., (384) (Pl.)
Mitchell, J. A., 563 (Lep.)
——, with Rees, (384) (Pl.)
——, & Robertson, G. W., 793 (Der.)
Mitra, M., 114 (Und.)
Muira, T., with Satomi & Hirakawa, 706 (Rab.)
Miyagawa. Y., with Nagayo, Mitamura, Imamura, Tamiya & Sato, 122 (Fev.)
Miyajima, M., 84 (B.R.)
Miyake, M., 108 (Sc.)
Mochkovski, C., 49 (Mal.)
Moetsch, J., with Raiziss & Severac, 141 (S.S.)
Moll, J. M., (413) (Mal.)
Mollow, W., 828 (Mal.), 993 (Misc.)
Momma, K., with Yoshida, 893 (Hel.)
Mondolfo, E., 367 (Dys.)
Monge, C. with Paz Soldan, 567 (Lep.)
Monroe, P. W., & Mooser, H., 718 (Fev.)
Montel, G. H. M., & Montel, M. L. R., 346 (Am.)
Montel, M. L. R., 676 (Misc.)
——, Tran van An & Dang van Cuong, 407 (Mal.), 930 (Bb.)
Monteleone, R., 399, 411 (Mal.)
Montero, A., 578 (Lep.)
Montgòmery, E., 962 (Misc.)
Montpellier, J., 233, 236 (Der.), 698 (K.A.)
——, & Lacroix, A., 880 (Hel.)
Moody, L. M., 624 (Misc.)
Moole, Y., with Davey, Iles & McNaughton, 558 (Syph.)
Mooney, H. L., 1000 (Misc.)
Moore, V. A., 704 (Rab.)
Mooro, A. W., with Dolbey, 325 (Misc.)
Mooser, H., with Monroe, 718 (Fev.)
Mora, A. D., 373 (Pl.)
Morales Villazon, N., with Uriarte, 382 (Pl.)
Morax, V., 950 (Oph.)
Moreau, G., 803 (Mal.)
Morgan, F. G., 215 (Lep.)
Morgan, H. J., 532 (S.S.)
Mori, S., with Suzuki, 101 (Bb.)
Morison, J., 250 (Rab.)
——, Naidu, B. P. B., & Avari, C. R., 381 (Pl.)
Morisseau, 214 (Lep.)
Morland, A. J., with Hudson & Zimmerli, (718) (R.F.)
Morrison, H., 539 (S.S.)
Morrison, H., with Lloyd, Johnson & Young, 290 (Z.)
——, with Sharp, 347 (Am.)
Moschkowsky, S., 696 (K.A.)
Moser, R. A., & Shaw, W. J., 670 (Misc.)
Moss, H. St. L., 300 (Z.)
Mosto, D., & Bosq, P., 876 (Hel.)
Motais fils & Pons with Lalung-Bonnaire, 67 (Misc.)
Mouchet, with Delamare, 881 (897) (Hel.)
Moukhtar, A., & Sedad, 892 (Hel.)
Mouriquand, G., Leulier, A., & Michel, P., 590, 591 *bis* (Sc.)
——, ——, ——, Idrac, 935 (Sc.)
——; Michel, P., & Berheim, M., 112 (Sc.)
——, Rochaix, A., & Michel, P., 110, 111 (Sc.)
Moutier, F., 883 (Hel.)
Moutoussis, C., 60 (Mal.)
Muchow, H., & Levy, D. M., 221 (Lep.)
Muehlberger, C. W., with Young, 331 (Misc.)
Mühlens, P., 620, 965 (Misc.)
——, & Sfarčić, A., 807 (Mal.)
Muijzert, P. C., 841 (Z.)
Muir, E., 569, 851, 855, 856 *bis* (Lep.)
——, assisted by De, N. K., Landeman, E., Roy T. N. & Santra, I. 223 (Lep.)
——, with Rogers, L., 256 (B.R.)
Mukherjee, H. N., & Saha, J. C., 999 (Misc.)
Mukerji, A. K., with Chandler, 458, 895 (Hel.)
Mukerji, G. N., 156 (Misc.)
Muller, H. R., 192, (726) (Y.F.)
——, with Noguchi, Torres, Silva, Martins, Ribeiro Dos Santos, Vianna & Biao, 188, (726) (Y.F.)
Müller, J., 361 (Dys.)
Munro, D., 695 (K.A.)
Münzer, F. T., & Singer, E., (831) (Mal.)
Murata, S., with Tagaki, Tamaki & Ito, 897 (Hel.)
Murdock, T. P., 239 (Der.)
Murillo, G. A., 704 (Rab.)
Murphy, R. A., 402 (Mal.)
Musso, M. L., & Perrin, M., 667 (Misc.)
Muzzarelli, E., 907 (Z.)

N

Nagayo, M., Miyagawa, Y., Mitamura, T., Imamura, A., Tamiya, T., & Sato, K., 122 (Fev.)
Naidu, B. P. B., with Morison & Avari, 381 (Pl.)
Nair, T. D., 541 (Pel.)

Nakamura, S., with Watanabe, Hasegawa, Kohno & Kawaguchi, 360 (Dys.)
Napier, F. H., 451 (Oph.)
Napier, L. E., 198, (207), 684, 689 (K.A.)
——, with Knowles & Smith, 193 (K.A.)
Nassau, E., & Scherzer, M., 111 (Sc.)
Nattan-Larrier, L., 120 (Und.), 695 (K.A.)
Nauck, E., 534 (S.S.)
Necheles, H., 901, 903 (Z.)
Nécl, 161 (Misc.)
Nègre, L., with Calmette & Boquet, 421 (B.R.)
Nell, A., 830 (Mal.)
Netter, A., & Urbain, A., 626 (Misc.)
Neuberger, J. K. W., 557 (Syph.)
Neufeld, F., 24 (Dys.)
Neves, J. da S., 560 (Syph.)
Neveu-Lemaire, 697 (K.A.)
—— & Deschiens, R., 876 (Hel.)
Newham, H. B., 964 (Misc.)
——, Wiltshire, H. G., & Scharff, J. W., 310 (Lab.)
Newsholme, A., 570 (Lep.)
New South Wales, 789 (Lab.)
Newstead, R., with Evans, A. M., & Potts, W. H., 80 (B.R.)
——, & Potts, W. H., 913 (Z.)
Nguyen-Van Khai, with Guérin & Lalung-Bonnaire, 441 (Tb.)
Nichols, H. J., 681 (Misc.)
Niclot, V., 821 (Mal.)
Nicolai, A., 150 (Misc.), 822 (Mal.)
Nicolas, C., with Wade & Lara, 574 (Lep.)
Nicolau, S., & Banciu, A., 220 (Lep.)
——, with Levaditi, 640 (Misc.)
——, with ——, Salgue & Schoen, 557 (Syph.)
——, with —— & Schoen, 243 (Rab.)
Nicolle, C., 687 (K.A.), 974, 975 (Misc.)
——, & Anderson, C., 194 (K.A.)
——, & Blanc, G., 976 (Misc.)
——, & Burnet, 243 (Rab.)
——, & Gobert, E., 376 (Pl.)
——, & Lebailly, C., 976 (Misc.)
Nida, 950 (Oph.)
Nieschulz, O., & Krijgsman, B. J., 839 (Z.)
Nigeria, Ann. Rep. Med. Res. Inst., 189 (Y.F.), 787 (Lab.)
Nikanorov, S., 377 (384) *bis*, 776 (Pl.)
Nikolsky, V. V., 286 (Z.)
Nino, F. L., 654 (Misc.)
Nishi, M., 471 (Hel.)
Nishigori, M., & Ohba, T., 487 (Hel.)
Nishimura, Y., 98 (Bb.)
van Nitsen, R., 356 (Dys.), 644 *bis* (Misc.)
Nitzulescu, V., 494 (Hel.)
Nobechi, K., 386 (Chl.)
Nocht, B., 84 (B.R.)
——, & Kessler, A., 416 (Bl.)
Nodake, R., with Kondo, 859 (Lep.)
Noël, P., 800 (Der.), 849 (Lep.)
——, & André, Z., 1001 (Misc.)
Noguchi, H., 192 (Y.F.), 692 (K.A.)
——, & Fróes, J. A. G., 188 (Y.F.)
——, & Lindenberg, A., 692 (K.A.)
——, Muller, H. R., Torres, O., Silva, F., Martins, H., Ribeiro Dos Santos, A., Vianna, G., & Biao, M., 188 (726) (Y.F.)
Nogue, M., 562 (Syph.), 982, 988 (Misc.)
Nord, F., 367 (Dys.)
Norman, C. E. S., & Ramachandran, C. S., 944 (Fev.)
Normark, P., with Palladin & Kudrjawzewa, 934 (Sc.)
Normet, M., 584 (Bb.)
Norris, R. V., with McCarrison, 594 (B.R.)

O

Obregia, A., & Popea, A., 61 (Mal.)
O'Brien, H. R., 895 (Hel.)
——, & Runchaiyon, B. M., 854 (Lep.)
O'Brien, R. A., & Runge, B. F., 752 (Dys.)
——, with Sudmersen & Runge, 22 (Dys.)
Ocaranza, F., & Varela, G., 515 (Und.)
O'Connor, 41 (Mal.)
O'Connor, F. W., 754 (Dys.)
O'Connor, R., 951 (Oph.)
O'Driscoll with Marjoribanks, 67 (Misc.)
d'Oelsnitz, Daumas, Liotard & Puech, 687 (K.A.)
Oerskov, J. L., 749 (Dys.)
Ogata, S., 882 *bis* (Hel.)
Ogata, T., Kawakita, S., Suzuki, T., & Kagoshima, S., 106 *bis* (Bb.)
Oh, S., 360 (Dys.)
Ohba, T., 882 *bis* (Hel.)
——, with Nishigori, 487 (Hel.)
Ohi, T., 279 (Z.), 473 (Hel.)
Ohki, T., with Sawada, 491 (Hel.)
Ohmori, S., with Tagawa & Hara, 587 (Bb.)
Ohoto, O., 382 (Pl.)
Ohta, K., 587 (Bb.)
——, with Toguchi, Okamoto, Hiraishi & Kwa, 587 (Bb.)
Ohtawara, T., 520 (Fev.)
Ohwada, S., 391 (Chl.)
Oi, T., 29 (Dys.)
Oiso, T., with Yokogawa, 891 (Hel.)
Okamoto, K., with Toguchi, Hiraishi, Ohta & Kwa, 587 (Bb.)

Okamoto, T., 947 (Oph.)
Okolska, M., (391) (Chl.)
Old, J. E. S., 148 (Misc.)
Oldrieve, F., 565 (Lep.)
Oldt, F., with Hayes, 448 (Oph.)
Olivelli, E., 48 (Mal.)
Oliver, T., 649 (Misc.)
Ollivier, J., 179 (R.F.)
Onorato, R., 800 (Der.)
Opie, E. L., 431 (Tb.)
Orenstein, J., 438 (Tb.)
Orlov, E. I., 776 (Pl.)
Orol-Arias, C., 793 (Der.)
Orpen, L. J. J., 779 (Lab.)
Otten, L., 631 (Misc.)
Oudenal, A. J. F., 500, 885 (Hel.), 1003 (Misc.)
Owensby, N. M., 542 (Pel.)
Oyama, R., 390 (Chl.)

P

Paes, S., 792 (Der.)
——, with de Mello, 792 (Der.)
——, with ——, Costa & Rebello, 636 (Misc.)
——, with ——, Pinto & Rebello, 698 (K.A.)
——, with ——, & Rebello, 698 (K.A.)
Pagé, J. D., 213 (Lep.)
Pagnier, A., & Schrumpf-Pierron, P., 806 (Mal.)
Pagniez, P. (831) (Mal.)
Paisseau, G., & Lambling, A., 441 (Tb.)
Palestine, 38, 804, 805 (Mal.)
Palladin, A., with Kudrjawzewa, A., & Normark, P., 934 (Sc.)
Pallary, P., (925) (Z.)
Palmer, F. J., 550 (Ys.) 766 (Chl.), 856 (Lep.)
Pamboukis, 706 (Rab.)
Panama Canal, 566 (Lep.)
Panayotaton, A., 13 (Am.)
Pang, C., 871 (Hel.)
Panisset, L., & Verge, J., 700, 705 (Rab.)
Pappalardo, C., 352 (Am.)
Paradice, W. E. J., 274 (Z.)
Park, W. H., 647, 648 (Misc.)
Parker, R. R., with Spencer, 521 *bis* (Fev.)
Parrot, L., with Sergent, Ed. & Et., Foley & Catanei, 400 (Mal.)
——, with ——, ——, Sénévet & Catanei, 38 (Mal.)
Parsons, E. A., with Gilbert, 311 (Lab.)
de Partearroyo, F. R., 116 (Und.)
Pascal, C., 19 (Dys.)
Pasero, P., 942 (Und.)
Pashin, A. N., with Scriabin, 884 (Hel.)
Passey, R. D., & Braine, J. C., 312 (Lab.), 476 (Hel.)
Patané, C., 464 (Hel.)
Patel, P. T., (391) (Chl.)
Paterson, A. R., 552 (Ys.), 555 (Syph.), 771 (Pl.)
Patrik, N. P., 944 (Fev.)
Patton, W. S., & Cookson, H. A., 911 (Z.)
Pawan, J. L., 677 (Misc.)
Pawlowsky, E., & Stein, A. K., 296 (Z.)
Payne, F. K., Ackert, J. E., & Hartman, E., 488 (Hel.)
Paz Soldan, C. E., & Monge, C., 567 (Lep.)
Peacock, W. H., with Blacklock & Wood, 584 (Bb.)
Pearson, H. R., 892 (Hel.)
Peck, E. C., 65 (Diet.)
Peltier, M., 867 (Hel.)
——, & Dominique, H., 486 (Hel.)
Pemberton, C. E., 915 (Z.)
de Penning, H. C., (384) (Pl.)
Perdomo Hurtado, B., 984 (Misc.)
Perekropow, G. I., 821 (Mal.)
Perrier, P., with de Lavergne, 720 (Jaun.)
Perrin, M., with Musso, 667 (Misc.)
Perrin, T. G., (192), 725 (Y.F.)
Perry, H. M., (207) (K.A.)
Pesme, J. L., with Worms, 954 (Oph.)
Pessôa, S. B., with Smillie, 460, 503 (Hel.)
Peter, K., with Reese, 55 (Mal.)
Peterson, R. A., 947 (Oph.)
Petragnani, G., 956 (H.S.)
Petri, E., 586 (Bb.)
Petridis, G., with Petzetakis, 738 (Am.)
Petridis, P. A., 350 (Am.)
—— with Valassopoulo, 253 (B.R.)
Petrie, G. F., (384) (Pl.)
Pettit, A., & Etchegoin, E., 186 (Jaun.)
Petzetakis, 6, 11, 13, 738, 741, 743 (Am.), (368) (Dys.)
——, & Petridis, G., 738 (Am.)
Peverelli, P., 390 (Chl.)
Pfannenstill, S. A., 989 (Misc.)
Pfanner, W., 884 (Hel.)
Pharm. Inst., L. W. Gans, A.-G., 780 (Lab.)
Phear, A. G., 13 (Am.), 24 (Dys.)
Philibert, A., 716 (R.F.)
Phillips, J. A. S., 58 (Mal.)
Philp, H. R. A., (505) (Hel.)
Philpot, F., 491 (Hel.)
Picazio, A., 387 (Chl.)
Pierce, L. B., 544 (Pel.)
Pierrot, with Hudelo, 216 (Lep.)
Pigeon, E., & Le Bourdelles, A. C. B. 655 (Misc.)
Pijper, A., 561 (Syph.)
——, & Russell, B. D., 54 (Mal.)
——, & Russell, E. D., 823 (Mal.)
Pineda, E. V., 580 (Lep.)

Pinto, C., 135, 536 (S.S.), 801 (Der.), (925) (Z.)
Pinto, J. F., with de Mello, Rebello, & Paes, 698 (K.A.)
Pirie, J. H. H., 465 (Hel.)
Pitschugin, P. I., 817 (Mal.)
Pittaluga, G., 113 (Und.), 393, 829 (Mal.)
Plantureux, E., 700 *bis* (Rab.)
Plaut, F., 710 (R.F.)
Plecker, with Smillie, 803 (Mal.)
Plehn, A., 401, 408, 409, (831) (Mal.)
——, & Mense, K., Junior, 84 (B.R.)
Podiapolsky, B., (505) (Hel.)
Poleck, 154, 965 (Misc.)
Polettini, B., 118, 911 (Und.)
Pollitzer, R., with Wu Lien Teh & Chun, 775 (Pl.)
Pons, with Lalung-Bonnaire & Motais fils, 67 (Mal.)
Pons, R., 170 *bis* (R.F.), 839 (Z.), 1001 (Misc.)
——, with Bernard & Bablet, 753 (Dys.)
——, with Sarramon, 981 (Misc.)
Pontano, T., 2 (Am.)
Ponticaccia, L., 941 (Fev.)
Pontoizeau, E. M. M., & Dutrey, M., 517 (Fev.)
Popea, A., with Obregia, 61 (Mal.)
Popesco, C., with Goresco, 62 (Mal.)
Popoff, P., 305 (Lab.), 642 (Misc.)
Popper, M., with Jonesco, 812 (Mal.)
Porter, A., 868, 881, (Hel.), 911 (Z.)
——, with Levin, 489 (Hel.)
Portois, 551 (Ys.)
——, Tilsley & Mairlot, (553) (Ys.)
Posselt, A., 16 (Dys.), 752 (Dys.)
Potts, W. H., 293 (Z.)
——, with Newstead, 913 (Z.)
——, with —— & Evans, 80 (B.R.)
Powell, A., 634 (Misc.)
Prates, M. M., 519 (Fev.), 680 (Misc.), 833 (Z.)
Pratt, W. W., 388 (Chl.)
Prausnitz, C., & Hille, G., 391 (Chl.)
Pribram, E., 24 (Dys.)
Price, J. D., 201 (K.A.)
Prigge, R., with Kolle & Schlossberger, 23 (Dys.)
Proc. Intern. Conference on Health Problems in Trop. America, 420 (B.R.)
Proescher, F., & Krueger, A. P., 304 (Lab.)
Protteau, P., 443 (Tb.)
Prussak, L., with Wizel, (831) (Mal.)
Pruys, H. S., 655 (Misc.)
Przesmycki, F., with Brokman, 747 (Dys.)
Public Health Reports, 850 (Lep.)
Puech, with d'Oelsnitz, Daumas & Liotard, 687 (K.A.)
Pugh, W. S., 472 (Hel.)
Pumpelly, W. C., 294 (Z.)
Pundit, S. R., with Cunningham, 685 (K.A.)
Puntoni, V., 244, 251, (252), 704 (Rab.)
Pupo, A., 566 (Lep.)
Pupo, J. de A., (861) (Lep.)
Puri, I. M., (925) (Z.)
Putzu, F., 795 (Der.)

Q

Quast, M., with Wilhelmi, 884 (Hel.)
Quimaud, J., with Girard, 381 (Pl.)

R

Radsma, W., 997, 998 (Misc.)
Raghavachari, T. N. S., with Cunningham, 309 (Lab.)
Rahmet Bey, H., 705 (Rab.)
Railliet, A., 863 (Hel.)
Railliet, G., 182 (Jaun.)
Raimunda, J. M., 921 (Z.)
Raiziss, G. W., Severac, M., & Moetsch, J., 141 (S.S.)
Raju, K. V., 709 (R.F.), 827 (Mal.)
Raleigh, J. T., with Marie, 305 (Lab.)
Ram, A., with Marshall, 378 (Pl.)
Ramachandran, C. S., with Norman, 944 (Fev.)
Ramakrishnan, S., with Cunningham, 237 (Der.)
——, with —— & Cruickshank, 646 (Misc.)
Ramón y Fananás, J., 703 (Rab.), 782 (Lab.)
Ramsay, G. C., 430 (Tb.), 546 (Ys.), 961 (Misc.)
Ramsin, S., & Schnitzer, R., 142 (S.S.)
Randall, A., 239 (Der.)
Rankin, 803 (Mal.)
Ransom, B. H., Harrison, W. T., & Couch, J. F., 488 (Hel.)
Rault, M., 38 (Mal.)
Rawlings, 803 (Mal.)
Ray, C. B., 202 (K.A.)
Raynal, G., 777 (Pl.)
Raynaud, L., 772 (Pl.), (831) (Mal.), 849 (Lep.)
Read, B. E., 222, 851, 855 *bis* (Lep.)
——, & Feng, C. T., 854 (Lep.)
Rebello, F., with de Mello & d'Almeida, 716 (R.F.)
——, with ——, Costa & Paes, 636 (Misc.)
——, with —— & Paes, 698 (K.A.)
——, with ——, Pinto & Paes, 698 (K.A.)
Rebêlo, F., & d'Almeida, C., 796 (Der.)
——, with ——, 696 (K.A.)
Redaelli, P., 156 (Misc.)
Reddy, H. L., 180 (Fev.)

Reed, A. C., with Hall, 744 (Am.)
Reed, J. G., 1000 (Misc.)
Rees, D. C., & Mitchell, J. A., (384) (Pl.)
Reese, H., & Peter, K., 55 (Mal.)
Reichenow, E., 843 (Z.)
Reicher, K., 365 (Dys.)
Reilly, J., with Teissier, Cambessédès & Cathala, 773 (Pl.)
Reinhold, 401 (Mal.)
Reis, F., Fraga, C., & Barreto, F., 643 (Misc.)
Reiss, F., 10 (Am.)
Remlinger, P., 237 (Der.), 242, 244, 246, (252) *quat.*, 700, 704 (Rab.), 864 (Hel.), 987 (Misc.)
——, & Bailly, J., 700 (Rab.)
——, & Bel, P., 314 (Lab.)
——, & Bernard, L., 446 (Oph.)
——, & Curasson, 242 (Rab.)
Renner, E. A., 497 (Hel.)
Di Renzo, F., & Amodeo, P., 956 (H.S.)
Revista Médica de Angola, 420 (B.R.)
Revista de Med. Veterinaria, 248 (Rab.)
Repetto, R., 703 (Rab.)
Reyes, C., 679 (Misc.)
Reynolds, F. H. K., with Holt, 936 (Und.)
Reznik, J., 417 (Bl.)
Rho, F., 84 (B.R.), 228 (Lep.)
Rhodes, B., with Gratia, 386 (Chl.)
Ribadeau-Dumas, L., & Larrousse, 912 (Z.)
Ribeiro Dos Santos, A., with Noguchi, Muller, Torres Silva, Martins, Vianna & Biao, 188, (726) (Y.F.)
Ricci, A., 739 (Am.)
Richards, P. B., with Fletcher, Sen, Christophers, Andrews, Edwards & Howard, 898 (Z.)
Richmond, P., (861) (Lep.)
Ridley, H. N., 677 (Misc.)
Ridley, H. W., 584 (Bb.)
Riecke, H. G., (581) (Lep.)
Rimé, with Troisier, 185 (Jaun.)
Rinjard, P., with Vallée, (252) (Rab.)
Ripley, L. B., 281 (Z.)
Risquez, F. A., 946 (Fev.)
Risquez, J. R., (179) (R.F.)
Rivas, P. F., 725 (Y.F.)
Rivas Maza, F. de P., 989 (Misc.)
Robert, V., 987 (Misc.)
Robertson, A., 179 (Fev.)
Robertson, G. W., with Mitchell, 793 (Der.)
Robin, A., 781 (Pl.)
Robineau, M., 563, 564 (Lep.), 626, 673 (Misc.)
Robinski, 752 (Dys.)
Robinson, G. H., 183 (Jaun.)
Robison, J. M., 450 (Oph.)
Rochaix, A., 701 (Rab.)
Rochaix, A., with Mouriquand & Michel, 110, 111 (Sc.)
Rockefeller Foundation, 81 (B.R.)
Rodenwaldt, E., 58 (Mal.), 508 (B.R.)
——, & Essed, W. F. R., 804 (Mal.)
Rodhain, J., 435 (Tb.), 531, (S.S.), 670 (Misc.)
Rodriguez, J., 572 (Lep.)
Rodriguez Arjona, V., 235 (Der.), 857 (Lep.), 943 (Fev.)
Rodriguez de Partearroyo, F., 942 (Und.)
Rogers, L., 208, (230), 571, 580 (Lep.), 427 (Tb.), 678, 957, 966, 984 (Misc.), 735 (Am.), 765 (Chl.)
——, & Muir, E., 256 (B.R.)
Rolleston, H., 926 (B.R.)
Rondelli, A., with Finzi, (252) (Rab.)
de Rook, H., 37 (Mal.), 418 (Bl.)
——, with Bijlmer, 325 (Misc.)
Root, F. M., 900, 919 (Z.)
Rosal, I., with Guerrero & Fernandez, 550 (Ys.)
Rose, F. G., 483 (Hel.)
Rosenau, M. J., 617 (Misc.)
Rosenthal, F., 143 (S.S.)
——, & Spitzer, F., 537 (S.S.)
Rosentul, M., & Kruglak, E., 858 (Lep.)
Roskott, E. R. A. L., 157 (Misc.), 892 (Hel.)
——, with de Langen, 821 (Mal.)
Ross, I. C., 299 (Z.), 875 (Hel.)
Ross, M. J., with Little, 15 (Dys.)
Ross, W. C., with Hussain, M., 277 (Z.)
Rosser, C., 992 (Misc.)
Rossi, L., 251 (Rab.)
Roubaud, E., 59, 807, 826 (Mal.), 916, (925) (Z.)
Rouillard, J., 223 (Lep.)
Roukhadzé, N., 808 *bis*, 826 (Mal.)
Rouvroy, 551 (Ys.)
Roux, J. C., 366 (Dys.)
Row, R., 204 (K.A.)
Rowe, J., 874 (Hel.)
Rowntree, C., 630 (Misc.)
Roy, A., 430 (Tb.)
Roy, D. N., with Megaw & Shettle, 518 (Fev.)
——, with Strickland, 907 (Z.)
Roy, J. N., 650 (Misc.)
Roy, T. N., with Muir, De, Landeman & Santra, 223 (Lep.)
Roziès, H., 513 (Und.)
Rubitschung, O., 812 (Mal.)
——, with Schilling, Jossmann, Hoffmann & van der Spek, 412 (Mal.)
Ruchadse, N. (831) (Mal.)
Ruchadze, N., 826 (Mal.)
Rudolf, G. de M., 53, 399, 809, 824, (831) (Mal.)
Rudolfs, W., 282 (Z.)
Ruiz, V., 517 (Fev.)

Runchaiyon, B. M., with O'Brien, 854 (Lep.)
Runge, B. F., with O'Brien, 752 (Dys.)
——, with Sudmersen & O'Brien, 22 (Dys.)
Runyan, R. W., & Herrick, A. B., 732 (Am.)
Russ, S., with Lawson, A., 954 (Oph.)
Russell, A. J. H., 765 (Chl.)
Russell, B. D., with Pijper, 54 (Mal.)
Russell, E. D., with Pijper, 823 (Mal.)
Russell, P. F., 903 (Z.)

S

de Sá, L. B., with de Mello, 124 (Fev.)
Saad, B., 409 (Mal.)
Sabatini, L., 204 (K.A.)
Sabolotny, D. K., 374 (Pl.)
Saceghem, R. van, 293 (Z.)
Sagredo, N., 886 (Hel.)
Saha, J. C., with Mukherjee, 999 (Misc.)
Saito, G., 484 (Hel.)
Sakai, K., with Aoki & Hayashi, 718 (Fev.)
Salazar, M., (413) (Mal.)
Salgue, J., with Levaditi, Nicolau & Schoen, 557 (Syph.)
Salim, T., 827 (Mal.)
Salkind, E., (413) (Mal.)
Salmerón Olivares, J. M., 755 (Dys.)
Saltzmann, F., 476 (Hel.)
Salvat Marti, 242 (Rab.)
Salvat y Navarro, A., 113 (Und.)
Sambon, L. W., 970 (Misc.)
Samson, J. G., with Lara, de Vera & Eubanas, 216 (Lep.)
Sanarelli, G., (391) (Chl.), 630, 676 (Misc.)
Sandground, J. H., 887 (Hel.)
San Román, C. S., 113 (Und.)
Santra, I., with Muir, De, Landeman & Roy, 223 (Lep.)
Sarkar, S. L., & Banerji, S. K., 161 (Misc.)
Sarramon & Pons, R., 981 (Misc.)
Sato, K., with Nagayo, Miyagawa, Mitamura, Imamura, & Tamiya, 122 (Fev.)
Satomi, M., & Hirakawa, H., 391 (Chl.)
——, Miura, T., & Hirakawa, H., 706 (Rab.)
Sawada, T., & Ohki, T., 491 (Hel.)
Sawyer, W. A., 98 (Bb.)
Sazerac, R., & Vaurs, R., 991 (Misc.)
Scaffidi, V., 956 (H.S.)
Schaburow, with Tschekanowsky, 251 (Rab.)
Schaeffer, H. F., 149 (S.S.)
Schagan, B., 589 (Sc.)
Scharff, J. W., with Newham & Wiltshire, 310 (Lab.)
Scherber, G., & Albrecht, O., 55 (Mal.)
Scherzer, M., with Nassau, 111 (Sc.)
Schiff, F., 357 (Dys.)
Schijveschuurder, W., with Barto, 844 (Z.)
Schilling, V., & Jossmann, 417 (Bl.)
——, ——, Hoffmann, K., Rubitschung & van der Spek, 412 (Mal.)
Schimkin, 947 (Oph.)
Schlossberger, H., with Kolle & Prigge, 23(Dys.)
Schmidt, H., with Uhlenhuth & Kuhn, 141 (S.S.)
Schnitzer, R., with Ramsis, 142 (S.S.)
Schöbl, O., 229 *bis* (Lep.), 1002 (Misc.)
——, & Andaya, J., 768 (Chl.)
——, & Basaca, M., 220 (Lep.)
——, & Kusama, H., 229 (Lep.)
Schochet, S. S., 239 (Der.)
Schoen, R., with Levaditi & Nicolau, 243 (Rab.)
——, with ——, —— & Salgue, 557 (Syph.)
Schousboë, 449 (Oph.)
Schrumpf-Pierron, P., with Pagnier, 806 (Mal.)
Schultz, E. W., & Marx, A., 330 (Misc.)
Schulz, M., 694 (K.A.)
Schurenkowa, A., with Marzinowsky, 206 (K.A.)
Schuster, H , 711 (R.F.)
Schwarz, Y., 717 (R.F.)
Schweinburg, F., 249, 250 (Rab.)
——, with Koritschoner, 699 (Rab.)
Schwetz, 523 (S.S.)
Scott, G. H., 346 (Am.)
Scott, H. H., 32, (372), 760, 761 (Sp.), 478 (Hel.)
Scott, J. M., with Simon, 778 (Lab.)
Scriabin, K. J., & Pashin, A. N., 884 (Hel.)
Sedad, with Moukhtar, 892 (Hel.)
Sédan, J., 949 (Oph.)
——, & Mastier, 448 (Oph.)
Sedgewick, J. P., with Larson, 115 *bis* (Und.)
See, P., 936 (Und.)
Séguin, 810, 822 (Mal.)
——, with Simon, Flandin & Lecoq, 842 (Z.)
Seguin, T., 400, (413), 822 (Mal.)
Seidelin, H., 409 (Mal.)
Seishin, R., 488 (Hel.)
Sellards, A. W., with French, 8 (Am.)
——, & Leiva, L., 9 (Am.)
Sen, P. B., with Brahmachari, 199 (K.A.)
Sen, R. T., with Shortt, 200 (K.A.)
Sen, S. K., with Fletcher, Christophers, Andrews, Edwards, Richards & Howard, 898 (Z.)

Sénévet, G., with Sergent, Edm. & Et., Parrot, Foley, & Catanei, 38 (Mal.)
Sequeira, J. H., 552 (Ys.)
de Sequeira, L. A. F., 577 (Lep.)
Sergent, Edm., 788 (Lab.)
——, with Sergent, Et., & Catanei, 819 *bis* (Mal.)
——, ——, & Foley, H., 826 (Mal.)
——, & ——, Parrot, L., Foley, H., & Catanei, A., 400 (Mal.)
—— & ——, ——, ——, Sénévet, G., & Catanei, A., 38 (Mal.)
Sergent, Et., 404 (Mal.)
——, & Gueidon, E., 206 (K.A.)
——, & Sergent, Edm., & Catanei, A., 819 *bis* (Mal.)
——, with ——, & Foley, 826 (Mal.)
——, with ——, Parrot, Foley & Catanei, 400 (Mal.)
——, with ——, ——, ——, Sénévet & Catanei, 38 (Mal.)
Service, S. F., 881 (Hel).
Sette, N., 874 (Hel.)
Severac, M., with Raiziss & Moetsch, 141 (S.S.)
Seyfarth, C., 43, 46 (Mal.) 568 (Lep.)
Sfarčić, A., with Mühlens, 807 (Mal.)
Shah, W., 173 (R.F.)
Shanks, G., 307 (Lab.)
Shapiro, J. M., with Kligler & Weitzman, 394 (Mal.)
Sharp, C. G. K., 466, 472 (Hel.)
Sharp, C. J. H., & Morrison, H., 347 (Am.)
Sharp, N. A. D., 376 (Pl.), 696 (K.A.), 923 (Z.)
Shattuck, G. C., 474 (Hel.)
——, & Theiler, M., 181 (Fev.)
Shaw, W. J., with Moser, 670 (Misc.)
Shelton, C. F., 61 (Mal.), 736 (Am.)
Shelton, T. S., 658 (Misc.)
Sherishorina, S., with Korobkowa, 301 (Z.)
Shettle, F. B., with Megaw & Roy, 518 (Fev.)
Shibata, Y., 106 (Bb.), 587 (Bb.)
Shiga, A., 722 (Jaun.)
Shih, W. H., with Yang Ting Kuang, 151 (Misc.)
Shillinger, J. E., with Hall, 456, 866 (Hel.)
Shimazono, J., 587 (Bb.)
Shiwozawa, S., with Koshina & Kitayama, 176 *bis* (R.F.)
Shoji, M., 949 (Oph.)
Shortt, H. E., 193, 195 (K.A.), 843, (925) (Z.)
——, & Brahmachari, U. N., 687 (K.A.)
——, with Christophers & Barraud, 683 (K.A.)
——, Sen, R. T., 200 (K.A.)
——, & Swaminath, C. S., 203 (K.A.), 279 (Z.)
Shousha, A. T., 463 (Hel.)
Shukevich, J., & Klinov, V., (384) (Pl.)
Sia, R. H. P., 201 (K.A.)
Sidgwick, H. C., 829 (Mal.)
Sikora, H., 644 (Misc.)
Siler, J. F., 1006 (Misc.)
——, Hall, M. W., & Hitchens, A. P., 943 (Fev.)
Silk, S. A., with Eldridge, Lind & & Trentzsch, 824 (Mal.)
da Silva, E. P., with Bettencourt, 868 (Hel.)
da Silva, F. V., 269 (Z.)
——, with de Mello, 278 (Z.)
Silva, F., with Noguchi, Muller, Torres, Martins, Ribeiro Dos Santos, Vianna & Biao, 188, (726) (Y.F.)
Silverston, J. D., 824 (Mal.)
——, with Grant, 53 (Mal.)
Simon, 860, (Lep.), 863 (Hel.)
——, Flandin, C., Séguin & Lecoq, 842 (Z.)
——, & Scott, J. M., 778 (Lab.)
Simonsen, J. L., with Anderson & Howard, 985 (Misc.)
Simmonds, H. W., 907 (Z.)
Sinclair, C. G., & Maxcy, K. F., 656 (Misc.)
Sinderson, H. C., 206 (K.A.), 919 (Z.)
Sindoni, M. B., with Caronia, 244 (Rab.)
Singer, E., with Münzer (831) (Mal.)
Sinton, J. A., 302, 844, 904, (925) *bis* (Z.), 405 (Mal.)
——, with Banerjea, A. C., 406 (Mal.)
——, & Hughes, T. A., 399 (Mal.)
——, & Lal, R. B., 44 (Mal.)
——, & Little, C. J. H., 904 (Z.)
Sison, A. B. M., with Sison, 164 (Misc.)
——, with ——, & de Leon, 980 (Misc.)
Sison, A. G., & Sison, A. B. M., 164 (Misc.)
——, ——, & de Leon, W., 980 (Misc.)
Sitsen, A. E., 147, 679 (Misc.)
Skalweit, W., (831) (Mal.)
Slater, W. K., with Wollard, H., 883 (Hel.)
Slot, J. B., 945 (Fev.)
Smillie & Plecker, 803 (Mal.)
Smillie, W. G., & Pessôa, S. B., 460, 503 (Hel.)
Smith, A. M., 272 (Z.)
Smith, D. N., with Gerstenberger & Champion, 109 (Sc.)
Smith, D. V., 450 (Oph.)
Smith, H., 991 (Misc.)
Smith, J., 16 (Dys.)
Smith, L. W., 30, 369 (Sp.)
Smith, R. O. A., 906 (Z.)
——, with Knowles & Napier, 193 (K.A.)
Smith, S., 678 (Misc.)
Smits, J. C. J. C., 4 (Am.), 1002 (Misc.)

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Problemi della Nutrizione (*Rome*)	1924—	Vol.	1—
Riforma Medica (Naples)	1924—	Vol.	40—
Rivista Critica di Clinica Medica (Florence)	1913—	Vol.	14—
Rivista Pellagrologica Italiana (Florence)	1913–23	Vol.	13–23 [Incomplete]
Sperimentale (Florence)	1913—	Vol.	67—
Terapia (Milan) Parte pratica	1924—	Vol.	14—

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Norsk Magazin for Laegevidenskaben (Christiania)	1921—	Vol.	82—

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Medycyna Doswiadczalna i spoleczna [formerly *Przeglad Epidemjologiczny*] (*Warsaw*)	1920—	Vol.	1—	

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Arquivos de Higiene e Patologia Exoticas (*Lisbon*) [formerly Archivos, &c.]	1905–19	Vols.	1-6	
Archivos do Instituto Bacteriologico Camara-Pestana (*Lisbon*)	1906—	Vol.	1—	
Bulletin de la Société Portugaise des Sciences Naturelles (*Lisbon*)	1907–20	Vols.	1–8	
Medicina Contemporanea (Lisbon)	1913–21	Vol.	31–39	

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Archivia Veterinara (Bucarest)	1920—	Vol.	14—	
Bulletin et Mémoires de la Société Médicale des Hopitaux de Bucarest	1919—	Vol.	1—	

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Arbeiten aus den Microbiologischen Institut des Volksunterrichtskomissariats (Moscow)	1925—	Vol.	1—	
Archives Russes de Protistologie (Moscow)	1924—	Vol.	3—	
Archives des Sciences Biologiques (Leningrad)	1923—	Vol.	23—	
Revue de Microbiologie et d'Epidemiologie (*Saratov*)	1922—	Vol.	1—	
Russian Journal of Tropical Medicine (*Moscow*)	1923—	No.	1—	

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Archivos del Instituto Nacional de Higiene de Alfonso XIII (*Madrid*)	1922—	Vol.	1—	
Boletin del Instituto Nacional de Higiene Alfonso XIII (Madrid)	1913-19	Vol.	9–15	
Revista Española de Medicina y Cirugia (*Barcelona*)	1918—	Vol.	1—	No. 1
Revista de Higiene y Sanidad Pecuarias (Madrid)	1917—	Vol.	7—	
Revista Medica de Barcelona (*Barcelona*)	1924—	Vol.	1—	
Siglo Médico (Madrid)	1924—	Vol.	74—	

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Acta Medica Scandinavica (Stockholm)	1920—	Vol.	54—	
Hygiea (Stockholm)	1920—	Vol.	82—	
Skandinavisk Veterinär-Tijdskrift (*Uppsala & Stockholm*)	1911—	Vol.	1—	

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Bibliography of Industrial Hygiene (Geneva)	1925—			No. 10—
International Journal of Public Health (*Geneva*)	1920–21	Vols.	1–2	
International Labour Review (Geneva)	1925—	Vol.	12—	
Rapport épidémiologique mensuel de la Section d'Hygiène du Secretariat, Société des Nations (Geneva)	1924—	No.	64—	
Schweizer Archiv für Tierheilkunde (Zurich)	1913—	Vol.	55—	

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Bulletin Sanitaire de Constantinople [formerly *Bulletin de l'Administration Sanitaire des frontières*] (*Constantinople*)	1921–23	Nos.	1–20	

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Canadian Engineer (Toronto)	1925—	Vol.	49—	
Canadian Medical Association Journal (Toronto)	1911—	Vol.	1—	
Public Health Journal (Toronto)	1926—	Vol.	17—	

CENTRAL AMERICA AND WEST INDIES.

Boletin de la Associacion Médica de Puerto Rico (San Juan)	1914—	Vol.	10—	
Jamaica Public Health Bulletin	1917—			
Monthly Reports of the Department of Health of the Panama Canal (Washington)	1907—			
Proceedings of the Medical Association of the Isthmian Canal Zone, formerly *Proceedings of the Canal Zone Medical Association (Mount Hope, C.Z.)*	1908-23	Vol.	1—13	

SOUTH AMERICA.

Amazonas Medico (Manaos)	1918-22	Vols.	1-4	
Anales del Departmento Nacional de Higiene (Buenos Aires)	1919-22	Vols.	25-28	
Anales de la Direccion de la Sanidad Nacional (Caracas)	1919-23	Vols.	1-4	
Anales de la Facultad de Medicina (Lima)	1918—	Vol.	1—	
Anales del Instituto Modelo de Clinica Médica (Buenos Aires)	1917—	Vol.	2—	
Annaes Paulistas de Medicina e Cirurgia (San Paulo)	1915—	Vol.	4—	No. 3—
Archivos Brasileiros de Medicina (Rio de Janeiro)	1911—	Vol.	1—	
Archivos da Escola Superior de Agricultura e Medicina Veterinaria (Pinheiro, E. do Rio)	1917-18	Vol.	1-2	
Boletin de la Sociedade de Medicina e Cirurgia de S. Paulo (Brazil)	1919—	Vol.	2—(ser. 2)	No. 2—
Brazil Medico (Rio de Janeiro)	1909—	Vol.	23—	
British Guiana Medical Annual	1890-92, 1894-1902, 1906—			
Cronica Medica (Lima)	1913—	Vol.	30—	
Gaceta Medica de Caracas (Caracas)	1914—	Vol.	21—	
Gaceta Medica de Ciudad-Bolivar (Ciudad-Bolivar, Venezuela)	1920-21	No.	67-80	
Memorias do Instituto Butantan (S. Paulo)	1918	Vol.	1	Nos. 1-2
Memorias do Instituto Oswaldo Cruz (Rio de Janeiro-Manguinhos)	1909—	Vol.	1—	
Repertorio de Medicina y Cirugia (Bogota)	1914—	Vol.	6—	
Revista Clinica (Medellin, Colombia)	1916—	Vol.	1—	
Revista del Instituto Bacteriologico (Buenos Aires)	1918-19	Vols.	1-2	[Incomplete]
Revista Medico-Cirurgica do Brazil (Rio de Janeiro)	1921—	Vol.	29—	
Revista de Veterinaria e Zootechnia (Rio de Janeiro)	1917—	Vol.	7—	
Revista Zootecnica (Buenos Aires)	1920—	Vol.	7—	No. 84—
Sciencia Medica. Revista Brasileira de Medicina e Sciencias Affins (Rio de Janeiro)	1923—	Vol.	1—	
Semana Medica (Buenos Aires)	1925—	Vol.	32—	
Servico Sanitario do Estado de Sao Paulo Trabalhos publicados	1918—	N.S. No.	1—	

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American Journal of Diseases of Children (Chicago)	1926—	Vol.	31—	
American Journal of Hygiene (Baltimore)	1921—	Vol.	1—	
American Journal of Pathology (Boston) [*formerly* Journal of Medical Research]	1925—	Vol.	1—	

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American Journal of Public Health (Albany, N.Y.)	1913–16	Vols. 3–6	
	1924—	Vol. 14—	
American Journal of Syphilis (St. Louis)	1925—	Vol. 9—	No. 4—
American Journal of Tropical Medicine (Baltimore)	1921—	Vol. 1—	
American Review of Tuberculosis (New York)	1926—	Vol. 12—	
Archives of Dermatology & Syphilology [*formerly* Journal of Cutaneous Disease including Syphilis] (New York)	1913—	Vol. 31—	
Archives of Internal Medicine (Chicago)	1908—	Vol. 1—	
Boston Medical & Surgical Journal (Boston)	1915—	Vol. 172—	
Bureau of Animal Industry Bulletins (Washington)	1909—	[Incomplete]	
Collected Reprints from the George Williams Hooper Foundation for Medical Research (Univ. of California)	1915–20	Vols. 1–4	
Collected Studies from the Research Laboratory, Department of Health, City of New York	1906–19	Vols. 1–9	
Cornell Veterinarian (Ithaca, N.Y.)	1917—	Vol. 7—	
Engineering News Record (New York)	1925—	Vol. 95	No. 15—
Experiment Station Records (Washington)	1921—	Vol. 44—	
Hygeia (Chicago)	1924—	Vol. 2—	
Hygienic Laboratory Bulletins (Washington)	1903—	[Incomplete]	
Illinois Biological Monographs (Urbana)	1915—	Vol. 1—	
Index Medicus (Washington)	1912–20	(2 ser.) Vol. 10–18	
Journal of Agricultural Research (Washington)	1920—	Vol. 20—	
Journal of the American Medical Association (Chicago)	1910—	Vol. 54—	
Journal of the American Veterinary Medical Association	1917–23	Vols. 51–62	
Journal of the American Water Works Association (Baltimore)	1925—	Vol. 14—	
Journal of Economic Entomology (Concord)	1908—	Vol. 1—	
Journal of Experimental Medicine (New York)	1896—	Vol. 1—	
Journal of Immunology (Baltimore)	1925—	Vol. 10—	
Journal of Industrial Hygiene & Abstract of Literature (Boston)	1922—	Vol. 3—	
Journal of Infectious Diseases (Chicago)	1904—	Vol. 1—	
Journal of Laboratory & Clinical Medicine (St. Louis)	1916—	Vol. 2—	
Journal of Medical Research (Boston) (now *American Journal of Pathology*)	1919–24	Vols. 41–44	
Journal of Parasitology (Urbana)	1914—	Vol. 1—	
Journal of Pharmacology & Experimental Therapeutics (Baltimore)	1925—	Vol. 25—	
Journal of Sociologic Medicine (Easton)	1916–18	Vol. 17–19	
Long Island Medical Journal	1919—	Vol. 13—	
Medical Record (New York)	1914–22	Vols. 86–101	
Military Surgeon (Washington)	1913—	Vol. 33—	
Monographs of the Rockefeller Institute for Medical Research (New York)	1920—	No. 13—	
New Orleans Medical & Surgical Journal (New Orleans)	1912—	Vol. 65—	
New York Medical Journal (New York)	1910–20	Vols. 91–112	
Proceedings of the New Jersey Mosquito Extermination Association	1914—		
Proceedings of the Society for Experimental Biology and Medicine (New York)	1903—	Vol. 1—	
Proceedings of the United States National Museum (Washington)	1879—	Vol. 2— [Incomplete]	

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Public Health Engineering Abstracts (Washington)	1924—		
Public Health Bulletins (Washington)	1908—	[Incomplete]	
Public Health Reports (Washington)	1909—	Vol. 24—	
Public Works (New York)	1925—	Vol. 56	No. 10—
School of Hygiene & Public Health : Johns Hopkins University : Collected papers (Baltimore)	1920—	Vol. 1—	
Social Pathology (Washington)	1924—	Vol. 1—	
Southern Medical Journal (Birmingham, Alabama)	(1911, 1912 incomplete) 1913—	Vol. 6—	
Southwestern Medicine (El Paso, Texas)	1917—	Vol. 1—	
Studies from the Rockefeller Institute for Medical Research Reprints (New York)	1913—	Vol. 17—	
Texas State Journal of Medicine (Fort Worth)	1905–22	Vols. 1–18	[Incomplete
United States Naval Medical Bulletin (Washington)	1909—	Vol. 3—	
United States War Department Bulletin (Washington)	1913—	No. 1—	
University of California (Berkeley) : Publications in Pathology	1903—	Vol. 1—	
Publications in Zoology	1908—	Vol. 6—	
University of Kansas : Science Bulletin (Lawrence)	1902—	Vol. 1—	
Venereal Disease Information (Washington)	1923—	Vol. 4—	
Veterinary Medicine (Chicago)	1913—	Vol. 8—	
Water Works. Monthly Issue of Engineering & Contracting (Chicago)	1925—	Vol. 64—	No. 6—

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Bulletin Médical Franco-Chinois (Peking)	1920—	Vol. 1—	
China Medical Journal (Shanghai)	1912—	Vol. 26—	
Contributions from the Peking Union Medical College (Peking)	1921—	Vol. 1—	
National Medical Journal of China (Shanghai)	1919—	Vol. 5—	

EAST INDIAN ARCHIPELAGO.

Geneeskundig Tijdschrift voor Nederlandsch-Indië (Rijswijk-Batavia)	1901—	Vol. 41—	[Incomplete]
Journal of the Philippine Islands Medical Association (Manila)	1921—	Vol. 1—	
Mededeelingen van der Volksgezondheit Dienst in Nederlandsch-Indië [formerly "*van den Burgerlijken Geneeskundigen Dienst*"] (*Batavia*)	1912—	Vol. 1—	
Mededeelingen uit het Geneeskundig Laboratorium te Weltevreden (Batavia)	1919—	3 Ser. A.	No. 1—
Nederlandsch-Indische Bladen voor Diergeneeskunde en Dierentielt (Batavia)	1919—	Vol. 31—	
Philippine Agricultural Review (Manila)	1916—	Vol. 9—	
Philippine Journal of Science, formerly *Philippine Journal of Science. Section B. Philippine Journal of Tropical Medicine (Manila)*	1906—	Vol. 1—	

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Agricultural Research Institute, Pusa, Bulletins. (Calcutta)	1912—		[Incomplete]

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Arquivos Indo-Portugueses de Medicina e Historia Natural (Nova Goa)	1921—	Vol. 1—	
Boletim Geral de Medicina e Farmacia (Nova Goa)	1919—	5 Ser.	No. 1—
Ceylon Journal of Science (Colombo)	1924—	Vol. 1—	
Indian & Eastern Engineer (Calcutta)	1915-21	Vols. 36-49	
Indian Engineering (Calcutta)	1915-24	Vols. 57-75	No. 6—
Indian Journal of Medical Research (Calcutta)	1913—	Vol. 1—	
Indian Medical Gazette (Calcutta)	1889-1908	[Vols. 24 & 34-43 Incomplete]	
	1909—	Vol. 44—	
Journal of the Association of Medical Women in India (Delhi)	1923—	Vol. 11—	
Memoirs of the Department of Agriculture in India. (Calcutta):			
Bacteriological Series	1912—	Vol. 1—	
Veterinary Series	1913—	Vol. 1—	
Report of the Agricultural Research Institute and College, Pusa. (Calcutta)	1907—		[Incomplete]

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Annual Reports of the Institute for Medical Research, Kuala Lumpur, Federated Malay States. (Kuala Lumpur)	1912—		
Archives des Instituts Pasteur d'Indochine (Saigon)	1925—	Vol. 1—	
Bulletins from the Institute for Medical Research, Federated Malay States	1924—		No. 1—
Bulletin de la Société Médico-Chirurgicale de l'Indochine (Hanoi & Haiphong)	1910-22	Vol. 1-12	[Incomplete]
Fascicule hebdomadaire du Bureau d'Orient (Singapore)	1925—	Vol. 1—	
Medical Journal of the Siamese Red Cross	1918-20	Vol. 1-3	
Monthly Bulletin of the Eastern Bureau (Singapore)	1925—	Vol. 1—	
Studies from Institute for Medical Research, Federated Malay States (Singapore)	1901—	Vol. 1—[Incomplete]	
Transactions of the Malaya Branch of the British Medical Association (Singapore)	1923—	No. 9—	

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Acta Scholae Medicinalis Universitatis Imperialis in Kioto (Kioto)	1916—	Vol. 1—	
Aichi Journal of Experimental Medicine (Nagoya)	1923—	Vol. 1—	No. 1—
Japanese Journal of Medical Sciences. Abstracts (Tokyo)	1922—	Vol. 1—	
Japan Medical World (Tokyo)	1921—	Vol. 1—	
Japanische Zeitschrift für Dermatologie u. Urologie (Tokyo)	1917—	Vol. 17	No. 7—
Jikwa Zasshi	1917-22		
Journal of the College of Agriculture, Imperial University of Tokyo (Tokyo)	1916—	Vol. 3—	
Journal of the Japanese Society of Veterinary Science	1922—	Vol. 1—	
Journal of Oriental Medicine (Dairen)	1923—	Vol. 1—	No. 2—
Kitasato Archives of Experimental Medicine (Tokyo)	1917—	Vol. 1—	
Kyoto Igaku Zassi (Kyoto)	1917-21	Vols. 14-18	
Mitteilungen aus der medizinischen Fakultät der Kaiserlichen Kyushu-Universität (Fukuoka)	1917—	Vol. 3—	
Mitteilungen aus der medizinischen Fakultät der Kaiserlichen Universität zu Tokyo (Tokio)	1911—	Vol. 10—	

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Mitteilungen ueber allgemeine Pathologie und pathologische Anatomie [formerly *Mitteilungen aus dem pathologischen Institut der Kaiserlichen Universität zu Sendai, Japan*]	1919—	Vol.	1—	
Mitteilungen der Medizinischen Gesellschaft zu Tokio (Tokio)	1917–20	Vol.	31–34	
Saikingaku Zasshi	1917–23			
Sei-i-Kwai Medical Journal (Tokio) ...	1913—	Vol.	32—	
Taiwan Igakkai Zasshi	1917—			
Tokyoer Medizinische Wochenschrift (Tokyo)	1917—	No.	2046—	
Verhandlungen der Japanischen Pathologischen Gesellschaft (*Tokyo*)	1911—	Vol.	1—	

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Archives de l'Institut Pasteur d'Algerie (*Algiers*)	1923—	Vol.	1—	
Archives de l'Institut Pasteur de Tunis (*Tunis*)	1906—	Vol.	1—	
Archives des Instituts Pasteur de l'Afrique du Nord (*Algiers & Tunis*)	1921–22	Vols.	1-2	
Archivio Italiano di Science Mediche Coloniali (*Tripoli*)	1920—	Vol.	1—	
Bulletin Médical du Katanga (*Elisabethville*)	1924—	No.	1—	
Bulletin de la Société Medico-Chirurgicale française de l'Ouest-Africain (*Dakar*) ...	1919–21	Vols.	1–3	
Bulletin de la Société Ophthalmologie d'Egypte	1912—			
Journal of the Department of Agriculture, Union of South Africa (Pretoria) ...	1921 -			
Kenya Medical Journal (*Nairobi*) ...	1924—	Vol.	1—	
Magallah Tibbiah El Masriah (Cairo) ...	1923—			
Medical Journal of South Africa [formerly Transvaal Medical Journal] (Johannesburg)	1912—	Vol.	8—	
Nyasaland Sleeping Sickness Diary (*Zomba*)	1908–15	No.	1-25	
Proceedings of the Transvaal Mine Medical Officers' Association (*Johannesburg*)	1921—	Vol.	1—	
Revista Médica de Angola (*Loanda*) ...	1921—	Vol.	1—	
Rhodesia Agricultural Journal (Salisbury)	1915—	Vol.	12—	
South African Institute for Medical Research (*Publications*)	1913—	Vol.	1—	
South African Medical Record (Cape Town)	1910—	Vol.	8—	

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Australian Institute of Tropical Medicine Collected Papers (*Townsville*)	1914—	No.	1—	
Commonwealth of Australia: Quarantine Service Publications (*Melbourne*) ...	1923–20	No.	1–19	
Commonwealth of Australia: Department of Health. Service Publications (*Melbourne*)	1922 -	No.	20—	
Industrial Hygiene	1924—	No.	1—	
Tropical Division	1923—	No.	1—	
Veterinary Hygiene	1924—	No.	1—	
Health (*Melbourne*)	1923—	Vol.	1—	
Health Forum (*Sydney*)	1923	Vol.	1	Nos. 1-4
Journal of the Australian Veterinary Association (*Sydney*)	1925—	Vol.	1—	
Medical Journal of Australia (*Sydney*) ...	1914—	Vol.	1—	
Queensland Agricultural Journal ...	1919—	Vol.	12—	
Records of the South Australian Museum...	1918—	Vol.	1—	

NEW ZEALAND.

New Zealand Medical Journal (Wellington)	1913—	Vol.	12—	No. 45—

The Bureau possesses complete sets of the following JOURNALS WHICH HAVE CEASED PUBLICATION :—

American Journal of Tropical Diseases and Preventive Medicine (New Orleans)	1913–16	Vols.	1–3
American Society of Tropical Medicine (Transactions) (New Orleans)	1904–14	Vols.	1–9
Archives des Instituts Pasteur de l'Afrique du Nord (Algiers & Tunis)... ...	1921–22	Vols.	1–2
Ectoparasites (London)	1921.	Vol.	1.
Journal of the London School of Tropical Medicine (London)	1911–13	Vols.	1–2
Journal of Tropical Veterinary Science (Calcutta)	1906–12	Vols.	1–7
Kala Azar Bulletin (London)	1911–12	Nos.	1–3
Medical Science. Abstracts and Reviews (London)	1919–25	Vols.	1–12
Paludism (Simla)	1910–12	Nos.	1–5
Scientific Memoirs by Officers of the Medical & Sanitary Department of the Government of India (Calcutta)	1902–12 (New Ser.)	Nos	1–60
Sleeping Sickness Bulletin (London) ...	1908–12	Vols.	1–4
Yellow Fever Bureau Bulletin (Liverpool)	1911–15	Vols.	1–3

NOTE.—The Director would consider proposals for the exchange of the Bureau publications with other medical and scientific journals in which original papers on hygiene, tropical diseases or parasitology are published.

The following serial publications not received by the Bureau are taken by the London School of Hygiene and Tropical Medicine and are available for reference in the joint library of the School and the Bureau (TROPICAL DISEASES LIBRARY) :—

Annales de Médecine (Paris)	1920—	Vol.	7—
Australian Journal of Experimental Biology and Medical Science (Adelaide) ...	1924—	Vol.	1—
Biochemical Journal (London)	1923—	Vol.	17—
British Journal of Dental Science (London)	1922	Vol.	65—
British Journal of Venereal Diseases (London)	1925—	Vol.	1—
Bulletin de l'Académie de Médecine (Paris)	1922—	Vol.	87—
Bulletin du Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française (Gorée)	1924—	Vol.	7—
Clifton Medical Bulletin (Clifton Springs, N.Y.)	1922—	Vol.	8—
Comptes Rendus de l'Académie des Sciences (Paris)	1910—	Vol.	150—
Index Medicus (Washington)	1921—	3rd Ser.	Vol 1—
Indian Medical Record (Calcutta) ...	1919—	Vol.	39—
Journal de physiologie et de pathologie générale (Paris)	1919—	Vol.	18—
Medical Annual (Bristol)	1921—	Vol.	39—
Mitteilungen aus dem Zoologischen Museum in Berlin	1910—	Vol.	5—
Nature (London)	1921—	Vol.	108—
Orvosi Hetilap (Budapest)...	1923—	Vol.	67—
Post-Graduate Medical Journal (London)	1925—	Vol.	1—
Quarterly Cumulative Index to Current Medical Literature (Chicago)	1916—	Vol.	1—
Records of the Indian Museum (Calcutta)	1916—	Vol.	12—
Sanidad y Beneficencia (Habana) ...	1910—	Vol.	3—
Transactions of the South Indian Branch of the British Medical Association (Madras)	1899—	Vol.	8—
Tropical Agriculture (Trinidad)	1924—	Vol.	1—
World's Health (Paris)	1922—	Vol.	3—
Zoological Record (London)	1920—	Vol.	57—

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